

CONTINUATION VOLUME VI, 154 pp. Tables, 22 cm.



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A

DESCRIPTION AND LIST

OF THE

LIGHTHOUSES
OF THE WORLD.

1861.



BY ALEXANDER G. FINDLAY,
Fellow of the Royal Geographical Society.

LONDON:
PRINTED BY AND FOR RICHARD HOLMES LAURIE,
53, FLEET STREET, E.C.
JULY, 1861.

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P R E F A C E.

THE Introductory portion of this Book is the substance of two Papers, by the Author, read before the Society of Arts on December 15, 1847, and March 3, 1858; which have been published in the Society's Transactions and Journal. It was thought, that by drawing the Sailor's attention to the methods by which the Lights are produced, it would be adding much to their utility, and prove interesting to many.

The varied features of the beautiful Systems in operation are necessarily, from the nature of this Work, very briefly adverted to; and many important topics have not been touched upon for the same reason. The excellent works of ROBERT, ALAN, and THOMAS STEVENSON, will furnish the reader with a fund of varied information, which will supply all deficiencies in this, should a further insight be desired.

Besides these works, and others of earlier date, quoted herein, the bulky Reports of the Select Committees of the House of Commons, of 1822, 1834, and 1845, and that of the Royal Commission published in the present year, if they have not advanced the subject of their inquiry, have collected and recorded a vast mass of detail bearing upon almost every relation of the Lighthouse System. Besides these, the Report of the United States' Lighthouse Board, in 1852, the works of Fresnel, and other Engineers of the French Commission, will give an excellent account of the condition and requirements of Lighthouses.

The lists of the Lights which follow have been re-arranged from those published by the Admiralty, which, under the careful superintendence of Commander EDWARD DUNSTERVILLE, R.N., have attained a completeness approaching perfection.

In order that this Work may preserve its utility for several years, by giving the latest information, a SUPPLEMENT, containing the additions and changes that have occurred during the previous year, will be annually forwarded on application as directed.

A. G. F.

London, July 1, 1861.

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PHAROLOGY; OR, A DESCRIPTION OF LIGHTHOUSES, AND THEIR ILLUMINATION.

CHAPTER I.

EARLY HISTORY OF LIGHTHOUSES.

To bring before the sailor's notice the many beautiful adaptations of refined science in operation in Lighthouses,—to explain their principles, and to enable him to distinguish one description of light from another, through a knowledge of its construction, is the object of the present Introduction. These subjects, though of great interest, were but little noticed till within a few years, although they have been brought nearly to the present perfection for a long period.

Amid the wonderful progress which has characterized the last quarter of a century the Lighthouse system has been one of the foremost. Wherever civilization and commerce have spread, there has the engineer marked its advance by these evidences of his skill; and it seems more than probable, that in the course of a very few years all the prominent points of the world interesting to the navigator, wherever his commercial pursuits lead him, will be indicated by day and night by these guardian monitors; while the whole west of Europe is now so well lighted as to very nearly approach perfection. Whether Lighthouses, as now understood, were used in the early periods of history is almost more than doubtful, although there are many allusions in the mystical writings of the ancients to such existing, and conjectures have been formed that Homer has mentioned them. Vague hypothesis has also made the single-eyed Cyclopes into Lighthouses; or even, in a figurative manner, Lighthouses themselves. It is more than probable that the prominent headlands of the Mediterranean were marked, in the very early ages, by beacon lights, to guide the coasting and timid voyagers of these distant ages. It has also been surmised, but without much reason, that the famous Colossus of Rhodes, erected about 300 B.C., was also used as a signal light.

Leaving these dark conjectures, we arrive at a certainty in the history of the famous Pharos of Alexandria, one of the seven wonders of the world. It served as a guide to the ancient mariners during the period of 1,600 years, and its remains are still to be recognized. Pliny says, in his Natural History, that it was built by Sostratus of Cnidus, by command of one of the Ptolemies, about 285 B.C. The cost of it was 800 talents (£243 15s.), or £195,000 English. It was square, of white stone, consisting of many storeys, and diminishing upwards. Its height, according to the authority of the Geographia Nubieensis, was 100 statuaries of man, or 300 cubits, (equal 20'480 inches,) equal to 512 English feet. In the upper chambers were windows looking seawards, and in these chambers torches or fires were burned to guide vessels into the harbour of Alexandria, and we are told by Josephus that these fires were visible at the distance of 300 stadia (or 29½ geographic miles).

This general description is applicable to nearly all Lighthouses down to the year 1811 or 1812. Its name was taken from the little Island of Pharos, on which it was erected, and hence it has been applied to Lighthouses generally, while the term Pharology was first introduced by the late Mr. Purdy to express our modern system.

Other Light-towers existed at Ostia, Ravenna, Apamea, and other places, as mentioned by Pliny, Suetonius, and Stephanus Byzantinus.

During the spread of the Roman power, this mighty nation planted these evidences of their nautical skill in their conquered countries. The Lighthouse at Coruña, northwest of Spain, is perhaps the oldest existing town now used as such. It is believed to have been erected in the reign of Trajan. It was re-established as a Lighthouse in 1634, and in 1847 had one of the finest modern apparatus erected in it.

In England we have an evidence of the Roman colonization in the Pharos which stands adjoining the ancient church on the highest part of Dover Castle, built prior to A.D. 53. A similar tower, now destroyed, existed on the opposite heights, and was called, from its hardness, "The Devil's Drop of Mortar;" another occupied the height of Boulogne on the French side. There perhaps may have been a Roman pharos on Flamborough Head, and another one on the coast of Flintshire. The known existence of these and others, and the inferred use of others in our own country, testify that these phari were among the many marks of the high civilization of those early days.

In the mediæval period, there are many Lighthouses of which we have some notices, as well as some which still are used as such. They were also frequently, perhaps more generally, a portion of other buildings. Thus, on an angle of the tower of the little church which crowns St. Michael's Mount, in Cornwall, are the remains of a stone lantern, perhaps nearly 500 years old, which is now known as the famous St. Michael's Chair. The Light at St. Elmo's Castle, Malta, has been shown since 1661. The Skaw Lighthouse, on the N. point of Denmark, recently rebuilt, dates from 1564. The oldest Lights now existing on the same sites in Great Britain, are those of Lowestoft, since 1609; Winterton and Dungeness, 1615; the North and South Forelands and Orfordness, 1634; the Isle of May, 1635; Portland, Harwich, St. Agnes, Flamboro', &c., all in the 17th century, and several others soon after these dates.

All these structures, however, do not differ in their principles from ordinary buildings on land, and were constructed only to show by night the uncertain illumination of a wood or coal fire, or other imperfect mode of lighting. Modern science has replaced all these methods by a very different order of building and apparatus; so that, although the brief description of lights in ancient times given above is interesting to the historian, it is only within almost the last century that the true requirements of these monitors have been recognized. As a building, the first structure, as a purely nautical work, was the Cordouan Tower, in the Bay of Biscay; and the next the Eddystone Lighthouse: with these commences the history of Modern Lighthouses.

CHAPTER II.

LIGHTHOUSES AND LIGHTVESSELS.

The famous Cordouan Tower at the mouth of the Gironde, in the Bay of Biscay, is a wonderful monument of skill. This elegant structure, the work of Louis de Foix, was completed in 1611, in the reign of the great Henri the Fourth of France, and was twenty-six years in building. It is minutely described by Belidor in his "Architecture Hydraulique." It was 197 feet high, and consisted of successive galleries, enriched with pilasters and friezes. Round the base is a circular building 134 feet in diameter, in which are the light-keepers' apartments, and which also forms a sort of outwork to break the force of the waves from the main building. The tower itself contains a chapel and numerous apartments, and is ascended by a spiral staircase. It has been lately modified and adapted to the modern system of lighting, and, after a lapse of 250 years, it is considered the finest Lighthouse in the world.

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The Eddystone Rock, off Plymouth, has attracted the attention of the public more, perhaps, than any other of our Lighthouse sites; not so much on account of its importance, but as forming an era in the construction of Lighthouses. The first Eddystone Lighthouse was built of wood, 80 feet high to the top of the vane, from Mr. Winstanley's designs, 1696-8. The light was first shown in November in the latter year, but it was soon found that the sea rose, so as "to bury the lantern under the water," although at the elevation of 60 feet above the rock. It was accordingly raised to 100 feet. In November, 1703, the tower requiring some repairs, Mr. Winstanley went to the Lighthouse to superintend them; but the storm on the 26th of that month carried away the whole erection, and every soul perished. The wreck of the *Winchilsea*, man-of-war, soon after occurred, as if to point out the necessity of a light; but the Trinity House could not obtain the sanction of the Government to commence until July, 1706, when a new timber erection was begun by Mr. John Rudyerd. It was subsequently destroyed by fire in 1755. This tower was circular, and 92 feet in height. The tower which exists here at present was erected by Mr. Smeaton, who has given an admirable description of it. The masonry was 76 feet 6 inches, and the top of the lantern 93 feet above the foundation. This noble erection, completed in 1759, stands a monument of fame to its constructor, and a lasting evidence of the correctness of the principles on which it is built. It will be self-evident, that the site of this, and similar erections, calls for extraordinary skill and solidity in their construction. They are therefore to be viewed as works *sui generis*, and must not be classed with similar buildings on land, removed from the tremendous force of the waves.

Smeaton's description has been so often referred to, that it is scarcely necessary to quote from it here. The various courses are so dovetailed into each other, and the whole secured together, that the tower is really almost as if cut out of a solid block. The immense difficulties which had to be overcome, from the first landing on the rock, on April 5, 1756, to the laying of the first stone, June 12, 1757, and the last, on August 24, 1759, render Smeaton's book one of the most interesting ever written.

The next Lighthouse in our country, of a similar nature, is the equally famous Bell Rock Lighthouse; whose constructor, the late Mr. Robert Stevenson, has also given us a most valuable account of the difficulties to be overcome, and the progress of the works, between its commencement, in August, 1807, and its completion, in October, 1810. It was first illuminated in February, 1811. The tower is 100 feet high, and cost £60,000.

A later, and the most noble erection of this kind, is that on the Skerryvore Rock, off the west coast of Scotland. This, from the designs of Mr. Alan Stevenson, the son of the engineer of the Bell Rock, and the talented engineer to the Scottish Lighthouse Board, cost in its erection, with the harbour for the tender and other necessaries, £87,000, and was first illuminated in 1844. The light is 150 feet above the sea, and the structure and its appliances exhibit every refinement that has hitherto been made in the varied particulars of the system.

The latest grand Lighthouse of this nature, and also one of the most important in the British list, is that on the Bishop Rock off Scilly, built by Mr. James Walker, 145 feet high, under the superintendence of Mr. H. Douglass, at an expense of £36,500.

The Lighthouse at Carlingford, on the East coast of Ireland, the foundation of which is 12 feet below high water, is an analogous structure, 111 feet in height, though not in such an exposed situation, was completed from the designs of Mr. George Halpin, in 1830.

Another noble and ornamental Lighthouse is on the West coast of France, on the Héaux (or Héaux) de Brehat. It is nearly as high as the Skerryvore, and is deserving of all admiration. Its base is circular, 60 feet in diameter, from whence

DESCRIPTION OF LIGHTHOUSES.

the tower rises to the height of 140 feet. It is beautifully fitted up in many respects.*

It is as difficult to estimate the nautical importance of these triumphs of engineering skill, as it is to calculate the wonderful force of waves that they have to bear against.

Mr. Thomas Stevenson, another of that eminent family of Lighthouse engineers, constructed an apparatus, like a railway buffer, that self-registered the force of the waves that struck it, which has been applied to this purpose.

In the Atlantic, according to observations made at the Skerryvore Rocks, the average result for five of the summer months, in 1843-4, was 611 lbs. per square foot. The average result for the six winter months of the same years was 2,086 lbs. per square foot, or three times as great as in the summer months. The greatest force registered was on the 29th March, 1845, during a westerly gale, when a pressure of 6,083 lbs. per square foot was exerted. The next highest was 5,323 lbs.

In the North Sea, at the Bell Rock Lighthouse, the greatest result obtained was 3,013 lbs. per square foot. This lesser force is to be attributed to the narrow space in which the waves have to travel in the North Sea, compared with the roll of the Atlantic. It must, however, be remarked, that it is almost impossible to receive the force unimpaired, as the waves are more or less broken by hidden rocks or shoal ground before they reach the instruments.

Even this tremendous force seems to be far less than that encountered at the Bishop Rock, probably the most exposed Lighthouse in the world. On January 30, 1860, a storm wave shook this tower, and tore away the bell, weighing 3 cwt., from its support at the top of the tower, more than 100 feet above the sea. Mr. Stevenson also has related some extraordinary circumstances of the force of waves at the Shetlands, which demonstrate that their power, if opposed, is almost irresistible. Therefore, if these sea-beaten towers were not, at least, equal in weight to a solid block of granite of 60 or more feet in height, they would not be able to withstand the waves.

The most obvious means to avoid this enormous amount of hydrodynamic force, is to reduce the extent exposed to it to the smallest possible limits, so as to offer the least possible resistance. Iron columns have been suggested and used for this purpose. But here another difficulty awaits us, namely, that iron, particularly *cast iron*, is decomposed by the action of sea water, and this to a very great extent, the effect being to convert it into a substance similar in its chemical properties to black lead. In evidence of this, on removing the wreck of the Mary Rose at Spithead, which had been sunk for 292 years, the iron shot, upon being exposed to the air, gradually became red hot and then fell into a dry powder resembling burnt clay. This is a serious obstacle to the permanency of such erections, and it has been proposed by Mr. Gordon to obviate it by using gun metal or bronze; but whether this would answer for piles is a question. Wood has also been used, as in the Small's Lighthouse off Pembrokeshire; but as it is liable to many sources of decay, and particularly to the ravages of the *teredo navalis*, when under water, it is not adapted for such structures.

Having stated these difficulties, the description of the means employed to overcome them will be better understood. The first to be noticed is the *screw pile* of Mr. Alexander Mitchell, C.E., of Belfast. This principle was first employed in the construction of the foundation of the Maplin Lighthouse, on the north side of the mouth of the Thames, which now exhibits a red light. This was commenced in 1838, and is as firm now as when first erected. It stands on the outer edge of the Maplin Sand, which consists of sand at the surface, and afterwards of sand and mud, exceedingly soft and penetrable, and therefore the erection of a Lighthouse upon such a foundation must be considered as a great achievement.

* See "Rambles of a Naturalist;" by A. de Quatrefages. Translated by E. C. Otte, 1857; vol. i. p. 121.

The principle of the screw-pile Lighthouse, is having a series of piles, nine in number, eight in the angles of an octagon, and one in the centre. These piles consist of a shaft of hammered iron, 5 or 6 inches in diameter, having a single turn of the flange of a screw 4 feet in diameter. This pile is screwed with great facility into the sand to the depth of 22 feet, and it was calculated that each of them would bear a weight of 64 tons. These nine piles were fixed in nine consecutive days in the summer of 1838, and upon this foundation of Mr. Mitchell's, the light-room was erected under the direction of Mr. Walker, the engineer to the Trinity Board.

Mr. Robert Stevenson proposed, in 1800, a structure similar to this, for the Bell Rock Lighthouse. It was intended to affix the foundation to the rocks, and that the iron shafts should support several storeys; whereas the Maplin and the Foot of Wyre Lights have but a single storey.

Mr. Mitchell previously completed a Lighthouse upon a similar foundation at the mouth of the Wyre River, in Morecambe Bay, about 30 miles north of Liverpool. It was commenced in November, 1839, and lighted in June, 1840. The foundation is formed of seven screw piles, six in a circle and one in the centre, each of them 5 inches in diameter, with a screw of 3 feet diameter, and these screws sunk 13 feet into the bank of exceedingly hard sand, which is occasionally dry at low water. On these screws is supported the Lighthouse, consisting of a floor, and the lantern above it.

This screw-pile system has also been adopted for standing Beacons.

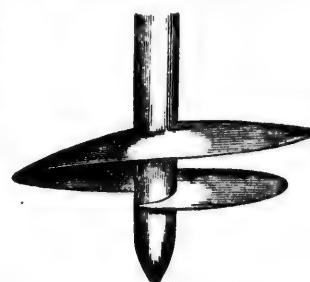
As far as experience goes, these Lighthouses answer all the purposes required of them, as regards stability, by offering the smallest possible surface to the force of the waves. How far the perishable nature of the iron may interfere with its permanency, must be left to time to unfold.

These pile Lighthouses have hitherto been placed in the less exposed situations, such as the Thames Mouth,

The Maplin Lighthouse, erected by Mr. Walker, upon Mitchell's screw-pile foundation.

Morecambe Bay, Belfast, Cork, &c., and have answered all their requirements. The proposal of Mr. Stevenson for the Bell Rock, above alluded to, was attempted on the Bishop Rock, and the structure was completed to the base of the lantern, when it disappeared in the course of a stormy night in January, 1850. The same disaster befel a similar structure on the Minot's Ledge, Boston Bay, U.S. These misfortunes have stopped any further extension of this principle, although it is of very great importance to secure a foundation on a treacherous bed in an exposed situation.

Many other plans have been suggested, among which the pneumatic pile of Dr. Potts deserves notice.



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DESCRIPTION OF LIGHTHOUSES.

This beautiful adaptation of atmospheric pressure has been applied to the erection of several Beacons in the vicinity of the mouth of the Thames. The first experiment was upon the Goodwin Sands, on July 16, 1845, and an iron tube of 2 feet 6 inches diameter was driven into the sand to a depth of 22 feet in two or three hours. A gentleman, present at the experiment, which was made by the Trinity Brethren, said, that the facility with which this large tube was made to descend could be compared to nothing better than shutting up a telescope. The method of operation is this:—One of the tubes being placed perpendicularly, an air-tight cap is fixed to the upper end. The cap communicates with a powerful air-pump, by means of which the air is exhausted from the tube, drawing up the sand or shingle with the water which ascends, and the tube immediately descends from the effects of outward atmospheric pressure. The contents of the tube are then removed by the pump, which readily draws away the sand or shingle with the water which rises during their action, and the exhausting process is then continued. The upper end of the tube having become level with the surface, the operation is stopped, the cap removed, a fresh tube is affixed and secured, and the same course pursued, and thus continued, until, with the greatest facility, this great length of tube penetrated what must have been exceedingly hard sand, nearly resembling stone, as was found by Mr. Bush in his erection of a caisson on these sands, for his light of all nations. The practicability of the scheme being proved, several Beacons, as before stated, were erected as on the Buxey, the Shingles, the Girdler, the Margate, and other sands lying in the mouth of the Thames.

Another plan has been carried into effect, at the Point of Air Lighthouse, at the entrance of the River Dee, near Chester. This, which is similar in superstructure to the Maplin Lighthouse, is by Messrs. Walker and Burges, and consists of nine hollow iron cylinders, 3 feet 9 inches in diameter, sunk 12 feet into the sand by the aid of an instrument known to well sinkers as "the Miser," which extracts the sand contained in the cylinder. In these the bases of the piles are inserted, and then filled with concrete. But this is erected above low water mark.

Another adaptation of iron to the construction of Lighthouses has met with far greater success, and promises to be of the greatest utility, whether as regards economy or facility of construction. This is the iron Lighthouse designed by Mr. Gordon. It would seem somewhat singular that iron should not have been employed in this form before, when we consider the multifarious variety of purposes to which it is now applied.

A cast-iron Lighthouse was mentioned by Mr. Rennie, in 1805, for the Bell Rock, and also, as previously stated, referring to Mitchell's screw piles, by Robert Stephenson, in 1800. Mr. Rennie, in alluding to the use of iron, says, "A Lighthouse of cast-iron might also be constructed here, and I will allow that it might have a coating of lead, or other metallic substance, so as for a long time, at least, to resist the effects of marine acid. But to make a Lighthouse that would last of such materials, would be nearly, if not wholly, as expensive as one of stone; while—I believe I need scarcely say—no human ingenuity could render it as durable." But Mr. Gordon has proved the futility of this latter assertion, in some experiments he has made. The first tower of this construction was placed on the eastern end of Jamaica, called Morant Point.

This noble tower is erected on the centre of the remarkable group of islands, the scene of Shakespear's Tempest, and the focus of the Atlantic hurricanes. The Light-tower is 105 feet 9 inches high, formed with iron plates, the entire weight of which is nearly 100 tons. It has seven storeys, and the lower portion is filled in with concrete, to the height of 22 feet, to give it stability. Nearly every portion of the edifice is of iron, and the erection of the tower was completed in ten months, finished October 9, 1845. The light is from a beautiful dioptric first order apparatus, constructed by Messrs. Wilkins and Son, of Long Acre; the lenses composing it were made by Mr. H. Lepaute, of Paris, and is one of the most efficient and powerful lights in the world.

One important point is the colour of Lighthouses. In many instances this has not been sufficiently attended to; and some of the noble Scotch towers, left of the natural colour of the stone, too much resemble the grey background. When it shows against

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the land, white, of course, is the best; and if against the sky, a dark colour is preferable. *Red* is sometimes used, as at Dungeness, &c.; and the extension of the use of coloured stripes and bands is recommended. This has been found particularly serviceable for day distinction in the British American lights, where the snow lies much longer against the field fences at right angles to the coast, and has precisely the same appearance at a distance as a white tower.

There is one difficulty in the use of coloured bands, and that is, during hazy weather, the appearance of the tower is frequently that of a ship under sail, the bright stripes being like the sails; this requires caution. The famous Eddystone has lately been painted in this way to distinguish it from the Bishop Rock.

The buildings we have been describing, commencing with those of ordinary land erections and terminating with such towers as the Bishop Rock, have been extended as far as human skill and power can probably be exercised. Still it is necessary, not only to mark a danger, or indicate safety, but to warn ships from the approach to a shoal or reef, or to show a channel far away from land.

The numerous light-ships which have been established by Great Britain have greatly fulfilled this requirement. Our country possesses 47 such vessels, of which 5 belong to Ireland and one to Scotland. Other countries have but very few light-ships, except the United States, which has 48; but they have only recently been made worthy of comparison with the English light-ships.

It is manifest that a lightvessel can perform its office but imperfectly compared with the stability ensured in a fixed Lighthouse. Its floating character prevents the use of that refined and enlarged apparatus which is the characteristic of a Shore Lighthouse. In addition to this, the establishment of a lightvessel is very much more expensive. The average cost of the English Lightships is £3,600; of the Irish, £2,200. Those of the United States (the best), the Nantucket New South Shoals, £4,375.

The cost of maintenance is much greater than that of a Lighthouse establishment. This is manifest from the difference of condition. Three men are sufficient to a rock Lighthouse, 11 are required to man a Lightship; consequently, while the annual cost of a first-class Lighthouse is from £265 to £340; in Scotland, £380; Ireland, £405 to £485; and in France, from £320 to £415; that of the Lightships amounts to £1,103, £1,464, and £1,320 per annum for England, Liverpool, and Ireland, respectively, and £1,354 for the United States' Nantucket vessel. These are strong arguments in favour of stationary buildings.

The question of their sufficiency depends also in some measure on the solution of a problem, which Mr. Herbert, of the Trinity House, proposes to make the subject of experiments on a large scale.

It has been proposed by him to extend the principle of lighting by establishing Floating Lights in the Fairway; the hulls to be constructed on the principle of his buoys, and the light the best known.

The efficiency of a Floating Light depends on the attention paid to the points in reference to the quality of Lighthouses, with one very important addition, namely, that it should remain on its station in all weathers.

"The best proof that the lights are efficient in the last particular is to be found in the statements of the Lighthouse authorities, which are fully confirmed by the evidence of mariners. The Lightvessels very seldom go adrift, and there is no instance on record in which the crew have voluntarily run from their stations in bad weather. When they have been driven from their moorings, the vessels have always been replaced in a very short time, and none have ever been wrecked. The mariners' evidence on this point is valuable, because the rare instances in which Lightvessels have been off their stations are repeatedly mentioned by independent witnesses as remarkable events. It does not appear that the lights have ever been accidentally extinguished." *

* Report of the Royal Commission, March, 1861, p. 17.

DESCRIPTION OF LIGHTHOUSES.

Much has to be learned about the best form for resisting the force of winds and waves when the vessel is always at anchor. The shape of the hull now varies considerably. Some are longer than others. The part of the vessel to which the moorings are attached, and the points where the chains enter, are different. The Irish vessels are generally longer and sharper than those in England, and set an after-sail when its use enables them to ride more easily. The testimony of the men on board has been in favour of considerable length, fine entrance, and a low point for attaching the moorings.

The Trinity House Lightvessels are painted red. In Ireland they are black with a white streak. At Liverpool, two are red and one black; and they are all distinguished by balls hoisted at the mastheads, and by other signals, and some have their names painted on their sides. Black and red seem to be the colours which contrast best with the colour of the sea, and they are, in fact, best seen.

The United States sea Lightships, where they have been constructed on the improved models of the European floats, since the establishment of the Lighthouse Board in 1852, are painted either cream-colour or white.

It is a remarkable fact, that the Lightships lying in very exposed situations, as that at the Seven Stones, near Scilly, and the Coningbeg, ride very much easier than those in shallow though sheltered waters, as at the Spurn, off the Humber; the Owers; the Cattegat, or the Arklow. This is owing to the great scope of heavy cable which is out in the one case, acting as preventive to her pitching heavily while she crosses the sea; and short cable renders a Lightship, in some positions, one of the most unpleasant situations in the world. In the shoal water, when the wind is strong, the vessels sometimes ride broadside to the tide and sea. Where the swell is much larger, as in the open ocean, the tides are not so strong. The efficiency of a Lightship is thus impaired by her want of stability. The remedy for this serious drawback involves the grand consideration, whether it is not possible to remodel the Lighthouse system, so to speak, by the establishment of deep sea Floating Lights, if a vessel can be constructed of such a form as to ride steadily and be secure at her moorings.

The proposal of Mr. George Herbert, above mentioned, for this important subject, is deserving of every consideration. In the case of the numerous buoys and beacons constructed and established on his principle, as shown in Liverpool Bay and elsewhere, it certainly does appear that the subject should not be relinquished till it is demonstrated that modern engineering skill cannot do in this what has been done in other apparently equal difficulties. Mr. Herbert's plan of the Beacon is that which keeps it constantly upright, with but little oscillation. His proposal is to moor a line of these large vessels along the fairway of the English and St. George's Channels, showing lights of the finest character at great elevations; so that by steamers passing up channel on one side and down on the other side, much of the risk of collision (that increasing and fatal evil) would be avoided, and the anxieties and dangers consequent upon hugging the land would also not be incurred.

A few words may be here added upon *Beacons* and *Buoys*, as accessories to our present subject. In some cases Beacons approach the excellence and costliness of standing Lighthouses. Thus the dangerous Wolf Rock and Rundlestone are marked with stone Beacons, the first of which cost nearly £12,000, and immense labour. There are 261 structures of some magnitude erected as Beacons under the public authorities of our country; and it is thought that our system, although capable of some improvement, is generally superior to that of foreign nations.

In the form and character of Buoys there has been very great improvement of late years, especially since the employment of iron in their construction, as in the case of ship-building. In Great Britain and Ireland, 1861, there were about 1,100 Buoys in position, excluding wreck, warping, and many others of minor importance; about one-half of which are under the public authorities. They generally keep their positions excellently, the chief accident occurring through being run down. Out of the whole number only 53 broke adrift in 1858, and of these a very large proportion were under local authorities. Mr. Herbert's Buoys, as before alluded to, answer their purpose admirably. Peacock's refuge Buoys are also excellent; and there are other

forms, as Lenox's and Poulter's, which are very efficient. The spiral form and dark colours (black or red) seem to be the most useful. The cost of a Buoy varies from £27 to £36 for the ordinary can, up to £130 and £197 for the first class spiral Buoys.

CHAPTER III.

LIGHTHOUSE ILLUMINATION.

1.—LIGHTS.

The first Lighthouses, such as the Cordouan and the North Foreland, had originally on their summit open fire-places, or chauffers; in that of the former were burnt billets of oak wood, and of the latter, coal; and this was the only means of indicating their situation during the night. A few words will show how incompletely these must have performed their office. Of course, the time at which a light becomes most serviceable is during tempestuous weather; and a wind, blowing towards the land, causes that dread to mariners—a lee-shore; yet this wind would drive the flames of an open fire away from the direction in which they were most wanted to be seen; thus the bars of the grate were often nearly melting to leeward, while towards the sea the coals remained untouched by fire. There was frequently, however, this advantage in the open fire, that during the fog or rain the glare of the fire was visible by reflection in the atmosphere, though the fire itself could not be seen. Such a feature would be of no advantage in the modern system, as will be hereafter shown.

The North Foreland Lighthouse, between Ramsgate and Margate, will be more familiar to many than other Lighthouses, and will serve as an excellent example of the progress of illumination. This Beacon was instituted for indicating the proximity of the Goodwin Sands. The first intimation we have of its existence is in 1636, in Charles the First's reign, when license was granted to Sir John Meldrum to renew and continue this and the South Foreland Lighthouse for the same purpose. At this time it was merely a large glass lantern on the top of a timber and plaster house, which was burnt in 1683. Towards the end of the same century, the present tower was partially erected; a strong octagonal structure, having the iron grate, or chauffer, for burning coals. From the difficulty of keeping up a proper flame in windy or rainy weather, about the year 1732, it was covered with a sort of lantern, with large sash windows, and the coal fire was kept alight by means of large bellows, which the attendants blew throughout the night. This was found not to answer, and the reflected glare above mentioned was thought desirable. Accordingly, the lantern was removed, and the fire restored to its original condition. Matters went on thus till 1790, when the tower was raised to its present height of 70 feet, and further improvements made in the lantern, by the introduction of lamps and other apparatus, hereafter to be described.

After some alterations of the Cordouan wood fire, the mariners complained that they could not see the light at the distance of two leagues as formerly. But Smeaton informs us, that the coal fire of the Spurn Point Lighthouse, at the mouth of the Humber, which was constructed on a good principle for burning, had been seen thirty miles off.

The only exceptions to the fires were the noble Eddystone lights, which then used to exhibit a chandelier of twenty-four wax candles, five of which weighed 2 lbs., and the Liverpool Lighthouses, which had oil lamps, with rude reflectors.

The use of coal fires has not been so long abolished as might be imagined. In Britain they were used till 1823. Thus the Isle of May Lighthouse, at the entrance

of the Frith of Forth, had a coal fire till 1810 ; at St. Bees Head, Cumberland, oil was first used in 1823 ; at the Flat Holm, Bristol Channel, in 1820, &c.

It is stated that a coal fire is still used on the Grönskär Lighthouse, East coast of Sweden. They were in operation on the two towers of Nidingen, in the Cattegat, till 1846.

The general use of *good* lights is of very recent date. During early times the modes of lighting were most imperfect, and the rude lamps, with their thick, torch-like wicks, which were the best then attainable, form a ridiculous contrast to the present universal brilliancy required.

Upon the introduction of the Argand lamp, a vast step was advanced towards the perfection of Lighthouses. This advance in artificial light was the greatest previous to the introduction of gas. It was discovered by M. Argand, a citizen of Geneva, about 1780 or 1785. It has remained as he left it, and appears as perfect in principle as can be looked for. Its perfection as an experiment was almost accidental. We are informed by the younger brother of Argand of its accidental discovery. He says, " My brother had long been trying to bring his lamp to bear. A broken-off neck of a flask was lying on the chimney-piece ; I happened to reach it over the table, and to place it over the circular flame of the lamp ; immediately it rose with brilliancy. My brother started from his seat in ecstasy, rushed upon me with a transport of joy, and embraced me with rapture." Thus was the Argand lamp formed.

On the introduction of a more efficient means of illumination, and the consequent abandonment of the coal fires, Lighthouses assumed a more important position in maritime affairs, and they were accordingly largely increased in number.

The cylindrical-wick lamp, in its various forms, is the usual mode of lighting employed in Lighthouses. For the reflectors, the wick is nearly an inch in diameter ; for the lens lights, a more powerful and complicated lamp is used.

For a first-order light, this lamp consisted, in the first instance, of four concentric wicks, of the respective diameters of 0·827, 1·69, 2·52, and 3·39 inches, the smaller apparatus being constructed of 3 or 2 concentric wicks ; but within these last 10 years the interior wick has been removed from all the burners, it being thought that a light of superior brightness could be obtained by allowing more air to pass into the flame on the inside, and forcing this air outwards on to it by a metal breaker or button kept below the level of the flame, so as not to interfere with the rays of light emanating from all sides of it. But an undue economy has been forced on the consumption of oil, and the metal button hiding some of the upper rays, it is probable that the efficiency of the light has been impaired, and a portion of it screened from the upper part of the apparatus. The original form of the lamp will therefore be restored.

The oil is made to flow into the burners by various means, as is stated above. Fresnel's invention consisted of a series of four small pumps, worked by clock-work, which forced the oil upwards to the flames. Another mode was by weights acting on a piston ; a third by a spring doing the same office, a plan which has since become in universal use in the moderator lamps. Another mode, the pneumatic lamp of Messrs. Wilkins, acted by means of the pressure of air in the reservoir ; and another, frequently applied of late, is by placing the reservoir slightly higher than the lamp, the oil thus flowing freely by its own gravity to the required level.

The fuel used in the English Lighthouses in these excellent lamps up to the year 1846, was the best sperm oil that could be procured. At that period a change was made throughout the whole of the lamps, by adapting them to the use of colza or refined rape-seed oil, requiring a thicker wick. This oil was in use in the French Lighthouses for some time prior to this, and was procured from the seed of a peculiar species of wild cabbage, known in the north of France under the name of colzat, or colza. This plant is extensively cultivated in Normandy, &c., the chief markets for the oil being Caen, Rouen, Lille, and Courtrai. That now used by the Trinity House is chiefly refined by a patent process. This refined oil is of a superior character to the sperm oil ; it produces a brighter flame, does not cause so much deposition on the wick, consequently, will burn longer without trimming ; any adulteration in it is much more easily detected than in sperm oil, and it is half the cost. It is an

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excellent substitute for the oil, which is annually becoming dearer, and more open to being mixed with other and inferior oils. In the Liverpool lights olive-oil has been used since 1847—a change effecting a saving of 40 per cent. on the use of sperm-oil. Olive-oil is also used in the Spanish and Austrian Lighthouses. The United States lights are supplied with sperm-oil exclusively. In our colonial Lighthouses other varieties of oil are used, of which one need only be noticed as being used in the Lighthouses near the Cape of Good Hope. This oil is procured from the tips of the tails of the Cape sheep, and is said to be far superior to any other oil for brilliancy of light; but the quantity consumed, and the expense, are great. It costs 10s. 6d. per gallon, and the first-order light of Cape Agulhas consumes about 730 gallons a-year; 482 gallons of rape-seed oil would be necessary for a year's supply.

One great advantage in the refined rape-seed oil is that it does not thicken, except upon a very great degree of cold, a qualification which places it far above sperm and many other oils for winter use. Indeed the change is a fortunate one in another respect. The untiring perseverance of the whale-fishers from the neighbourhood of Nantucket has so dispersed and destroyed their prey, that it is almost doubtful if a continuous and sufficient supply could be maintained, except at great prices.

The purity of the fuel, and the perfect combustion effected by the present arrangement of lamps, keep the flames used in the apparatus in their normal condition; but it is necessary to carry off the products of combustion from the confined space of the light-room, for, if they were not disposed of, they would both materially diminish the power of the light, and also be a serious detriment to the health of the attendant light-keeper, whose constant presence in the light-room is strictly required. This is effected by the ventilating tubes devised by Dr. Faraday, with the principles of which most are familiar; they are fitted to all our Lighthouses. A plan, similar in action, but less complete in detail, was promulgated at the commencement of the present century by Dr. Van Marum.

That a light of such intensity will be discovered as will penetrate a fog, may be considered as utterly hopeless. The sun, the great source of light itself, is entirely obscured by a comparatively thin film of vapour; and although we have artificial lights which apparently rival in brilliancy that of the sun, they are quite incapable of being seen to any great distance under such circumstances.

Perhaps it would be as well to notice here the very great distances to which lights have been visible. One of these is recorded in the account of the trigonometrical operations in France by MM. Biot and Arago. The points to be connected with Campvey, on the Island of Iviza, and a rocky mountain on the continent of Spain, called Desierto de las Palmas. On the former a powerful lamp with reflectors was placed. After watching for some months, a supposed minute star was identified as the signal light, and was afterwards easily recognized by the observers. This was a distance of nearly 100 miles. It is not intended by this example to say that a light could become serviceable at such a distance, but that it is possible to cause a light to be seen so far.

All modifications of lamp light sink into utter insignificance when compared with some other lights, produced by chemical means, from which very great expectations were formed, but hitherto with very little prospect of successful introduction. The first we shall mention is the Drummond light, generally known as the oxyhydrous or lime light.

Lieut. Drummond, the first promulgator of this splendid light, was employed in the grand trigonometrical survey of England, in the course of which it became necessary to connect by observation Leith Hill, in Surrey, with Berkhamstead Tower in Hertfordshire, which were to be seen, but could not be distinguished from each other. The discovery arose from his consideration of Berzelius's experiments with the blow-pipe, as detailed in the "Philosophical Transactions," 1826—1831; and from the intense light produced in these, Lieut. Drummond was induced to try a jet of flame from the combined gases, oxygen and hydrogen, on a ball of lime. Many trials of its intensity were made, one of which was in the north of Ireland. A hill in Inishowen, called Slivesnaght, was always enveloped in haze by day, and a Drummond light was placed on it. In the line between it and the observing station was a church

DESCRIPTION OF LIGHTHOUSES.

tower, much nearer to the latter, and on this an ordinary reflector was placed. The Drummond light, at the distance of 70 miles, was much more elevated than the other, which was 12 miles distant, and thus they appeared nearly on a level. When they were both seen, the Drummond light appeared to be much nearer and brighter than the lamp at 12 miles.

Its enormous power is evident from this, and it has been reckoned equal to 264 Argand lamps; and this is produced from a ball of lime $\frac{1}{2}$ of an inch in diameter, and the angle which this minute object would subtend at the distance of 70 miles is only 1 5-6th part of a second.

The difficulties of introducing this light, however desirable, appeared at first to be insuperable. The preservation of an equal intensity of flame is almost impossible, from the rapid diminution of the lime ball by fusion and volatilization, and by its frequently cracking and breaking. It has also the most painful effect on the eyes of the attendants, and is most injurious to the sight.

The difficulties, however, of maintaining a steady light has been in part overcome, as an arrangement has been made by Mr. Renton which preserves the cylinder of lime from cracking, and then jets of the combined gases produce a most brilliant flame. It has not yet been tried to any great extent in Lighthouses.

A proposition for increasing the intensity of the flame of the oil lamp was made by Mr. Gurney, in 1835; this was to impinge upon the flame jets of oxygen gas. This, by increasing the combustion, certainly enhanced the effects of the flame, but it charred the wick; and in this case, as in the former, it would be difficult to apply it to Lighthouses, from their isolated position, and the difficulty and danger of producing and keeping the gas.

The method of illumination by gas has in some instances been successfully tried, as in the Lighthouse at Hartlepool. The burner here is that of Mr. M'Niel. Gas, as an illuminator for Lighthouses, was proposed, in 1823, by Signor Aldini, of Milan.

The splendid light obtained by electricity has long been a desideratum, and numerous trials and great skill has been employed in overcoming its difficulties. It was hoped that the apparatus of Messrs. Staite and Petrie (1848) would have been successful, but it was found to be uncertain. M. Dubosc has designed an excellent lamp, which is used in philosophical experiments; but it requires delicate management, and is very expensive. Mr. Harrison's plan has not come into use.

There are two great difficulties in solving the problem of a steady light from electricity. The first is, in maintaining an equable force from the producing elements, that is, the battery, which, of course, will gradually decline in power after a short time, and no means have, as yet, been devised for so thoroughly obviating this, as to keep up for so many hours as the light must be shown. The next is, at the outlet of this current; in preserving that exact distance between the two points of carbon, through which the arc passes, which maintains the light in its normal condition. These carbon points are usually formed of graphite, the substance which is found lining the inner surface of the old gas retorts. The rapid disintegration of the positive pole, the less diminution of the negative pole, and the irregularity of the consumption of both under the intense action, have baffled the ingenuity of almost all who have attempted to control them.

Professor T. H. Holmes has adopted another form of originating the current than has hitherto been tried—that of magneto-electricity. The whole apparatus and its results are an admirable exemplification of the correlation of the physical forces—an evidence that one power may be traced throughout a train of operations until it emanates in a totally different form. The apparatus consists of a series of very powerful permanent magnets, around the poles of which the helices are made to revolve by means of a steam-engine, and from the extent of the primary arrangement a most powerful magnetic current is produced, which, passing through the carbon pencils, shows that splendid light which entirely eclipses all other modes of illumination.

This beautiful adaptation was used for 6 months in the upper Lighthouse of the North Foreland, and was very successful. The light, which is not $\frac{1}{4}$ inch in diameter,

was shown to disadvantage in the great lens, which, being adapted for the great lamp, was not suitable for it, and appeared at a distance of a bluish colour, probably by contrast with the red or yellow flame of the adjoining oil lamps. It is to be tried at the Dungeness Lighthouse.

The totally distinct character and colour of the electric light, will at once distinguish it at any distance from that derived from any other source. Therefore, supposing that this illumination be adopted as an adjunct to that in present use, the stations in which it is applied will be distinguished from their neighbours without the chance of mistake, the fruitful source of accident from the present lights.

Lieut. Raper, in his admirable work, proposes another method of showing a light for sea purposes, that is, by illuminating the clouds and haze over the station by the electric light. It was also proposed by Sir Edward Belcher, in 1833. This shaft of luminosity might be inclined in various directions, or it might be made to revolve by proper optical arrangements, and this would give a great relief to the already exhausted resources for varying the appearances of lights; but there is one case which might render this system of no avail, and that is a perfectly pure atmosphere.

This brief exposition must suffice as to the source of light. The apparatus used to control or economise this light is of two characters, either by reflectors or lenses, the catoptric and dioptric systems.

2.—THE CATOPTRIC, OR REFLECTOR SYSTEM.

The effects of a light in giving out rays without any controlling apparatus, will be to fill a sphere whose radius is equal to the distance at which the light is visible. In the light shown from a Lighthouse, those beams which are thrown upwards or downwards beyond the reach of vision would be totally lost for practical utility; it becomes necessary, to economise the light, to deflect these rays and cause them to assume that direction only in which they would be required. For all practical purposes, at present, we may consider that those only which issue in an horizontal direction are effective, and our apparatus must be so ordered to answer the end of forming a horizontal band or zone of light.

To do this we have two alternatives, the one to reflect the errant rays into the proper direction, by means of mirrors of the requisite form; or to deflect them, by causing them to pass through some refracting medium for the same purpose; in other words, to apply lenses of a particular form before the light, or reflectors behind the light.

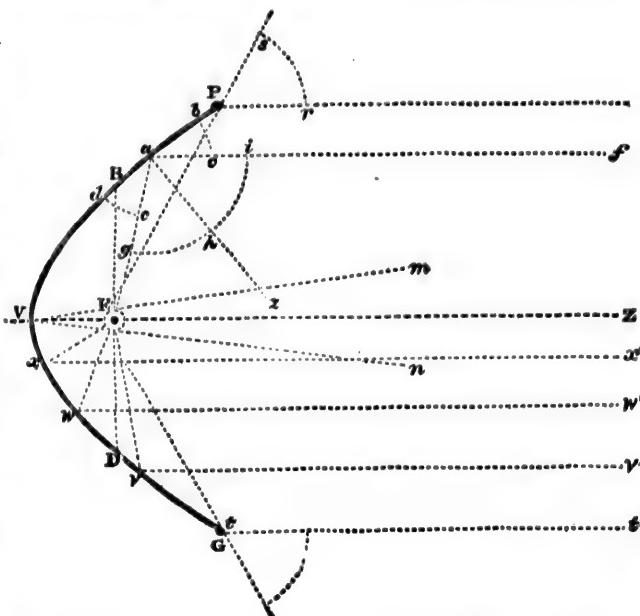
The first idea of economising light, by the means of reflectors, is met with in the history of the Cordouan light. M. Bitri, who remodelled the lantern in 1727, arranged it for burning pit coal, of which 225 lbs. (French) were ignited at once, and lasted the night. Above the fire, instead of having a hollow cupola, as it had previously been, or of being entirely open like other Lighthouses, the circle of the ceiling of the cupola was made the base of an inverted cone, whose apex projected downwards three feet; the whole surface of this was covered with tin plates. These becoming reflecting surfaces, served to increase the intensity of the light; but how they were kept free from tarnish, and the effects of the smoke, we are not informed. Here we have the first element of the reflector system, and it is virtually the principle of the present Bordier-Marcey apparatus. Such an arrangement would certainly answer its requirements as applied to a coal fire, and any improvement on it must be also made in conjunction with some better mode of producing a light.

As the Catoptric principle depends on the figure of the parabolic curve, we will first describe this curve.

The Parabola is a conic section, whose figure possessing certain properties, renders it available for the purposes of reflection, and the true formula for its construction, as applied to Lighthouse purposes, is given by Captain Joseph Huddart, F.R.S.

DESCRIPTION OF LIGHTHOUSES.

The form given to the Lighthouse reflector is generated by the revolution of this curve round its axis, producing a semblance to a portion of a sphere. Its properties will be better understood by the diagram. The line P V G is such a parabolic curve, and within it is a point, F, which is called the *focus*, which is the situation of the lamp in the reflector, of which this may be supposed to be a section. Now it is a fundamental law in optics, that the angle of incidence is equal to the angle of reflection, that is, the ray is thrown off a reflecting surface at the opposite angle to which it is received. The peculiarity of this curved line of the parabola is, that any line drawn from the focus, F, to the parabolic curve, as F a, makes



with the normals to the curve, as a z, angles equal to the inclination of these same normals respectively to lines drawn parallel to the axis, V Z. Thus a ray from the lamp, F, thrown on the surface of the reflector at a, will be reflected in the direction a f, which is parallel to the axis, V Z, and the angle of reflection, b a c, is equal to the angle of incidence, d a e; or, in other words, it makes with the normal, a z, the angle, g a h, equal to the adjacent angle, h a i. And this property belongs to every portion of the surface of the parabola, and consequently the rays will be represented by the lines F x z, F w w', &c. Thus it will be understood that this reflector must be most perfect in its action at that portion comprehended between the vertex, V, and the rectum or principal parameter, B D. For, as any deviation from the true figure will, of course, be doubled by the operation of the instrument, it will be readily seen that the acute angles made by incident rays, towards the mouth of the reflector, will be much more easily distorted by any defect, than when the angles are much more obtuse, and the reflection more direct, as they will be behind the parameter. This will show, as before, that the portion at the back of the light is the most effective of the parabolic reflector. There is some loss of light in the reflector, which will be more particularly adverted to presently.

Supposing it possible to produce a perfect reflector of the foregoing figure, and in its focus we were to place a *point* of light, it would send forth a *cylinder* of rays equal in diameter to its double ordinate, or the distance between G and P; and if we had to construct a light apparatus which should exhibit a light in every direction in azimuth, or round the whole 360 degrees of the horizon, it is manifest that it would be impossible to do so with any number of such instruments: there would be dark intervals between the directions of their axes.

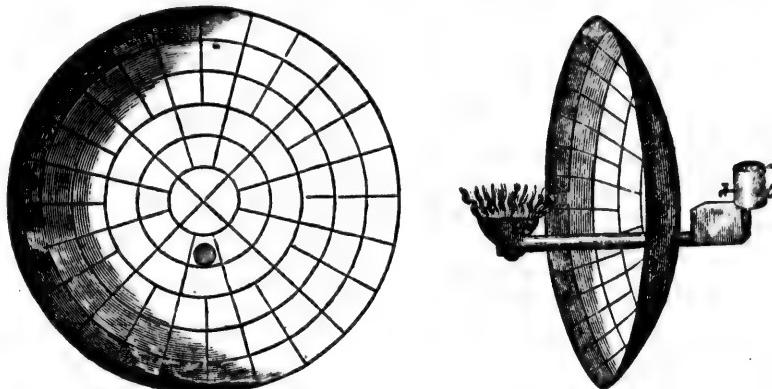
But here another circumstance awaits us. The flame of one inch in diameter, used

In illuminating such a reflector, supposing the focal length of the reflector to be four inches, will subtend an angle of $14^{\circ} 22'$ at the vertex of the parabola, or the angle m V n . Thus the reflected rays from the external edges of the flame will diverge from the axis to one-half such an angle on either side of it. This divergence decreases in those rays which strike the surface at greater distances from the vertex, but, combined with other circumstances, between 11° and 15° or 17° of divergence may be considered as effective from such an instrument. It would therefore take from 25 to 33 such reflectors to form a complete zone of light.

With respect to the invention of parabolic mirrors, we find them mentioned at a very early period, though not in connection with the subject of illumination, but in reference to their powers of focalising the rays of the sun to form burning instruments, an inverse principle of that of lamp reflectors. In a work entitled "Pantometria," by Leonhard Digges, published in London in 1571, the author states that "with a glasse framed by a revolution of a section parabolicall, I have set fire to powder half a mile and more distant." In the prosecution of this subject, the celebrated Napier and Sir Isaac Newton experimented with parabolic reflectors before 1673. And the celebrated Buffon, with the same object, proposed the polygonal lens, now modified for Lighthouse purposes, as will be mentioned hereafter.

The first parabolic reflectors for Lighthouses were used at Liverpool, probably in 1763, certainly previous to 1777, for in that year William Hutchinson, Dock Master of that place, published his "Practical Seamanship," and in that work he fully describes the apparatus used in the four Lighthouses built at Liverpool in 1763.*

The origin of their use is curious. It is said, that at a convivial meeting of some scientific men at Liverpool prior to this date, that one of the company wagered that he would read a newspaper at the distance of 200 feet by the light of a farthing candle. This he afterwards won by means of a wooden bowl, lined with putty, in



Parabolic Reflectors used in the Liverpool Lighthouses, erected in 1763; copied from a plate in Hutchinson's "Practical Seamanship," 1777, formed of wood and lined with pieces of looking-glass, or of plates of tin. The oil kept on a level with the flame by a dripping-pot, supplying the reservoir at the back.

* Lighthouses were not always looked upon as useful aids. The Mayor and Corporation of Liverpool wrote to Sir G. Ireland, their representative in Parliament, on January 5, 1670, to appear against *Reading's patent for Lighthouses*:—"In regard those Lighthouses will be no benefit to our Mariners, but a hurt, and Expose them to more danger if trust to them; and also be a very great and unnecessary burden and charge to them." See *Transactions of the Historic Society of Lancashire and Cheshire*, vol. vi. pp. 16 and *24.

which facets of looking-glass were embedded, and formed a reflector. One of the company was William Hutchinson, who, seizing the idea, thus utilized it.

These reflectors were formed to a parabolic curve by a somewhat rude process, which he describes.

"We have had," says Mr. Hutchinson, "and used here in Liverpool, reflectors of 1, 2, and 3 feet focus, and 3, 6 $\frac{1}{2}$, 7 $\frac{1}{2}$, and 12 feet diameter. The smallest made of tin plates soldered together, and the largest of wood covered with plates of looking-glass, and a copper lamp, the cistern part for the oil and wick stands behind the reflector, so that nothing stands before the reflector to interrupt the blaze of the lamp acting upon it, but the tube that goes through with a spreading burner mouth-piece, to spread the blaze parallel thereto, and with the middle of it just in the focus or burning point of the reflector.

"The lamps are like the reflectors, proportional to make a greater or less blaze as required; their spreading burning parts are from 3 to 12 and 14 inches broad, and are trimmed every four hours.

"Thus are these Lighthouses constructed, kept, and situated, and have stood the test of a fair trial, and the preference and advantages given to them even by their opponents, as there always will be to new things commonly calling them new whims, till time and trial confirm them as useful improvements."

Thus writes Mr. Hutchinson, in 1777; and he also proposed other and more complete reflectors similar to those we now possess.

The reflectors now used in the Trinity House lights are constructed, as before mentioned, according to the formula proposed by Captain Joseph Huddart, F.R.S., an Elder Brother of the Trinity Corporation; and a man of whom England may be proud. These reflectors are hence known by the name of Huddart's reflectors, and, as far as their principle is concerned, they may be pronounced perfect. Their manufacture is conducted with every care; but, of course, it is *absolutely* impossible to produce a faultless instrument: but as they are made, they may be considered among the most perfect specimens of workmanship.

The proposition for parabolic reflectors was made by M. Teulère, of the French Royal Engineers, in a memoir dated June 26, 1783, as intended for the Cordouan Lighthouse, but they were in use in England many years previous to that period.* They were also constructed, by Lenoir, of silvered copper, under the direction of the Chevalier Borda, in 1780.

In the year 1786, reflectors and oil lamps were proposed at the first meeting of the Scottish Lighthouse Commissioners. The first metallic reflectors used in the Northern Lighthouses were constructed by Mr. Thomas Smith, of Edinburgh. The figure was given to them by a plaster mould, and the cavity was afterwards filled in, by means of cement, with small facets of mirror-glass. This must have done its work very imperfectly, although the general figure was capable of considerable accuracy. In

* In the admirable account of the Skerryvore Lighthouse, &c., by Alan Stevenson, Esq., p. 205, and in his "Rudimentary Treatise on Lighthouses," p. 73, the merit of the first application of reflectors is awarded to M. Teulère, as above. But the author quotes from a second (or Liverpool) edition of Hutchinson's work, in 1791. The first (or London) edition, illustrated by the same plates, and containing much the same matter, was published in 1777, under the title of "A Treatise on Practical Seamanhip," &c.; a different title to the second edition. It is beyond question that reflectors were in use in Liverpool before they were in the Cordouan.

Hutchinson closed a life of much usefulness and excellence in 1870. He was dock-master in or prior to 1759. In 1764 he commenced a valuable series of tide and meteorological observations, continued 'till August, 1793. In early life he was shipwrecked, and the crew being without food drew lots to ascertain who should be put to death, to furnish a revolting and horrible meal to the survivors. The lot fell upon Hutchinson, but they were providentially saved by a ship which hove in sight. He ever afterwards observed this day as one of strict devotion. "Trans. Historical Society of Lancashire and Cheshire," vol. ix. pp. 240, 241.

1803, the first polished metal reflectors used in Scotland, were placed in Inch-Keith Lighthouse.

The reflector system has been called the English system, in contradistinction to the lens or French system. This is because we had numerous Lighthouses in which this fine apparatus had been perfected before the French, who were second in this field, had any systematic arrangement, which was indeed not until after 1825. In the early days of the present Lighthouses these reflectors were supposed to do their work so perfectly that but little could be gained by a change to the expensive and difficult system of lenses. Later inquiries have not entirely subverted this opinion.

"It has been generally assumed that the dioptric is preferable to the catoptric system; but while your Commissioners do not controvert this opinion, they have conclusive evidence that many of the catoptric lights in England are not only excellent in themselves, but exceed in efficiency the dioptric lights on its shores. The first part of Question 7, of Circular VIII., addressed to mariners, runs thus:—'What British light have you usually seen farthest off?' And out of the 579 witnesses who have answered this question, the greatest *distances* are mentioned with reference to the lights at Lundy Island, the Calf of Man, Tuskar, Flamborough Head, Beachy Head, and Cromer; and the greatest *numbers* of witnesses mention Flamborough Head, the Lizard, Lundy, Beachy Head, the Start, and the South Stack, all of which are catoptric revolving lights, with the exception of the Lizard, which is catoptric fixed, and the Lundy and Start, which are dioptric revolving."

The reflectors in use by the Trinity House are 21 inches in diameter for shore lights, and 4 inches of focal length, having a total reflecting surface of 518·6 square inches. They cost about £31 10s. The Scotch are of 24 inches aperture, and cost £43. Messrs. Wilkins are proposing them of 36 inches in diameter. They are most excellently made, and have lasted, unimpaired, 30 or 40 years.

The brilliancy of the ray from this reflector is considerably stronger in the direction of the axis, that is, when viewed directly in front, than it is for some distance on either side of that direction; and at great distances, in *fixed* lights, when you are in the direction *between* the axes of the adjoining reflectors, the light is frequently glimmering and feeble, but a small change in the position of the ship brings you again into the brighter beam of the reflector, one of which, it will be understood, is only in sight at a time. This is an important observation to the sailor, in distinguishing one fixed light from another, of different description of apparatus.

When a *revolving* light is required, a number of these reflectors are fixed to the sides of a triangular or quadrangular iron frame, and the whole caused to revolve in regular periods, by means of clockwork. The reflectors on each side of the revolving frame, from four to eight in number, are thus successively directed to every point of the horizon; and the combined result of their rays form a flash of greater or less duration, according to the rapidity of their revolution.

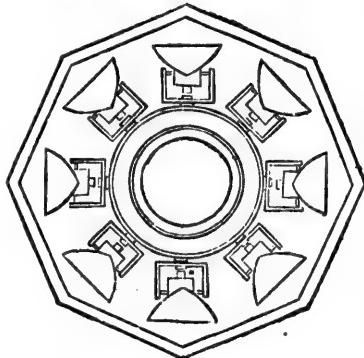
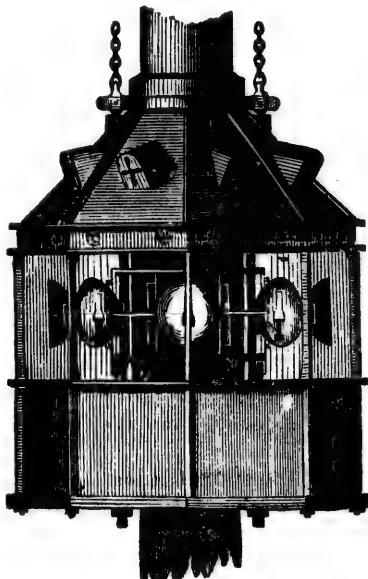
From the amount of divergence (13), the period during which such a light will remain visible is from 12 to 15 seconds, the light gradually increasing, and as gradually diminishing. And as the action of the reflector is only in the direction to which it is placed, the intervals between the flashes will be quite dark, for a shorter or longer period, according to the distance from which it is viewed, whether it is beyond that to which the unassisted flame will reach.

The light from a revolving catoptric or reflecting system is much brighter than from a fixed light on either principle, as you have the combined effect of several reflectors, each of which gives an equal amount of light, it is calculated, to 350 or 450 such lights without any reflectors.

In floating Lightvessels the light is always shown from parabolic reflectors. These are smaller than those used in Lighthouses, being 12 inches in diameter. For fixed lights, eight lamps and reflectors, each suspended on gimbals, or on ball and socket-joints, so that they always maintain their perpendicularity, notwithstanding the roll-

* Report of the Royal Commission, March, 1861, pp. 7, 8.

ing of the vessel, are arranged in an octagonal lantern, which goes round the mast, and is hauled up to the mast-head when on service, and is let down on the deck during the day, or while the lamps are trimming. Revolving lights for floating Lightvessels have four or eight lamps, and similar reflectors, and the lantern revolves around the mast. The adjoining diagram is a representation of one of Messrs. Wilkins' Revolving Light Lanterns. It is very similar to that of a fixed light, the clock-work moving it is placed between decks.



parabola around its focus in a horizontal plane; the centre of this is taken out to admit the lamp, which thus has all around it, above and below, a reflecting surface, which sends its upward and downward rays in a horizontal direction.

The lights in the ensuing list, which are upon the catoptric or reflecting system, are distinguished by this mark ●. Their magnitude, or order, is not indicated; the class of the light is to be inferred from its importance.

Only one English Lightvessel, that in the Tees, has a dioptric apparatus. Several of the Lightvessels are now made to show revolving red or bright lights where they were formerly fixed lights, as in the case of the Nore Lightship, it having been found that in many cases it was difficult to distinguish the fixed light of the Lightvessel from the mast-head lights of the ships at anchor near them.

The red revolving lights are now made very efficient. The red light is made by using a coloured chimney to the lamp; or, in some cases, a pane of red glass is placed upon the reflector. A green or blue light is sometimes used as a pier mark, or in other subordinate positions; but red is the only efficient colour. The French coloured lights are much paler than ours. The best red glass is coloured with chloride of gold, known in the middle ages as the purple of Cassius. It has only been rediscovered of late years. When the Bell Rock Lighthouse was completing, there was great difficulty in procuring the red panes for the coloured flash.

An apparatus for producing an *intermitting* light, of the only appearance to which such a term is applicable, is in use in three of the Scottish Lighthouses, the invention of Mr. Robert Stevenson. It is an arrangement by means of which the light is suddenly obscured by an eclipsor, and as suddenly appears again at its full brilliancy. This feature distinguishes it completely from revolving lights, which come gradually to their greatest brightness, and as gradually decrease, and this either from the reflecting or refracting apparatus.

There is yet another sort of reflector in use in France for harbour lights, called the Bordier Marctet apparatus, from its inventor, or the sideral lamp (*fanal sidéral*). It is used with a single lamp, and consists of two circular reflectors about $13\frac{1}{2}$ inches diameter, whose figure is formed by the revolution of a

parabola around its focus in a horizontal plane; the centre of this is taken out to admit the lamp, which thus has all around it, above and below, a reflecting surface, which sends its upward and downward rays in a horizontal direction.

The lights in the ensuing list, which are upon the catoptric or reflecting system, are distinguished by this mark ●. Their magnitude, or order, is not indicated; the class of the light is to be inferred from its importance.

3.—THE DIOPTRIC OR LENS SYSTEM.

This system,—that in which the controlling apparatus is placed before the light,—is next to be considered.

There are several very early notices, which seem to shadow out this principle. One is given in Smeaton's account of the Eddystone, where a London optician proposed to grind the panes of the lantern to circular segments, so as to form a sphere of 15 feet in diameter. This was negatived, and we cannot learn what the particulars were, although an optician, it would be thought, would deal with refraction and economise the light.

The use of lenses in Lighthouses dates from early times. It is more than probable that Argand's invention soon directed attention to the best mode of concentrating the light. William Hutchinson relates an experiment tried at Liverpool with a hollow lens filled with brine, which, however, was broken by the heat of the lamp. It is certain that they were placed in one of the Portland Lighthouses between 1786 and 1790, by Thomas Rogers. These lenses were 21 inches in diameter, and $5\frac{1}{4}$ inches thick in the centre; the flame of the lamp was 3 inches in diameter, and behind it was placed a glass (spherical) reflector, 12 or 18 inches in diameter, and by a new method silvered over the convex side without quicksilver. These lenses were also adopted by Rogers in the Lighthouses at the Hill of Howth, and at Waterford. Similar, but smaller lenses, 16 or 18 inches in diameter, carefully worked, and which cost £50 each, were in use at the North Foreland. There were 15 of them placed there at the commencement of the present century by the Governors of Greenwich Hospital, where they remained till 1834, when the Trinity House replaced them by reflectors, which have again recently been removed for a beautiful new dioptric apparatus.

The lens apparatus now in use is peculiar. It is called, from its figure, the Annular or Polyzonal Lens.

The history of the polyzonal lens is simple. Like the parabolic reflector, it was originally designed for a burning instrument, by collecting the rays of the sun, and for no other purpose. For a very long period these instruments, of various forms, occupied a large share of the attention of the experimentalists of the last and preceding centuries. Modern progress has converted them into scientific toys.

The merit of the earliest suggestion is due to the celebrated Buffon, the French naturalist, who, in 1773, according to Condorcet, proposed, for a burning glass, to form it of three concentric circular pieces upon each other. If a lens were required of 24 inches in diameter, and 3 inches thick in the middle, then the central portion was to be of 8 inches diameter, and 1 inch thick, inserted into a circular zone; ground to the same focus, and 16 inches diameter; and this again into a similar zone of 24 inches. Buffon states that the rays would be twice as powerful passing through 1 inch, as they would through 3 inches thickness of glass.

The suggestion of Buffon was acted on by the Abbé Rochon, with some success, in 1780; but his operation consisted in grinding down a single piece of glass into concentric rings. A similar lens was made by Messrs. Cookson, of Newcastle-upon-Tyne, and tried by the Northern Lighthouse Board. This process is necessarily attended with an enormous amount of trouble and expense, and the result must be precarious.

The particulars of Buffon's invention appear in most of the English and Scotch Encyclopædias, published after 1796. In 1812 Sir David Brewster proposed a plan for a built lens in the Edinburgh Encyclopedia, vol. v. This was also intended for a burning instrument, and no mention is made at this time for its converse properties, that of distributing light, as adopted for Lighthouses. There is no need of controversy on this. Lighthouses, at this date, had not then attained the importance they now have; and the beautiful reflectors then in use, as in the Bell Rock, were considered to do their work perfectly. Besides this, the polyzonal lens is not adapted for *fixed lights*; the cylindric refractor for the purpose was not perfected till 1836.

It is to the late M. Augustin Fresnel that we owe the introduction of the lenticular system, and hence it is frequently called by his name. Its origin dates from

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1819. During the progress of the great Trigonometrical Survey of France, under MM. Arago and Mathieu, powerful lights were used as signals; and one of these lenses, 3 feet in diameter, constructed by M. Soleil from the designs of Fresnel, was applied to a large lamp on Cape Grisnez, and other places, in the autumn of 1821. Major Colby, who was employed in the operations on our side, informed Mr. Robert Stevenson of the particulars, in Nov. 1821. On July 23, 1823, the splendid revolving apparatus of this system was first shown in the Cordouan Lighthouses.

In 1824, Mr. Robert Stevenson visited the French Lighthouses, &c., and reported on them to the Scottish Lighthouse Board. The first application of the system there was in the Isle of May Light, by Mr. Alan Stevenson, the talented son of the before-named eminent Lighthouse engineer, in October, 1825. Holland was the first to follow France in the use of the system. The Trinity House erected the first lenticular apparatus in the Start Lighthouse, 1836.

The Lighthouses of France were very few in number prior to Fresnel's invention; upon his success the French Government determined upon the establishment of the grand system adopted in 1825, and of the sole application of the lens in all cases of new lights. The case was different on our side. Many of the present lights existed long before the invention of Fresnel, and, having been erected as exigencies arose, there necessarily was not that exact order and regularity that might have been attained by a total change and remodelling at any period. That our system does not suffer by comparison with those of other countries, is a grand proof of the talent of our Trinity Board and other authorities, and of the skill of our engineers.

The lenticular apparatus may be thus described:—It consists of a central and powerful lamp, of course emitting luminous beams in every direction. Around this is placed an arrangement of glass, so formed as to *refract* these beams into parallel rays in the required directions.

The laws of refraction are well understood, and require but little explanation here. We shall just allude to it sufficiently to elucidate our subject. When a ray of light passes out of a rarer into a denser medium, or *vice versa*, it is refracted from its original direction, and assumes that which is induced principally by the density of the second medium. This is made familiar by the bent appearance of an oar, or a mooring when it dips beneath the water. The use of the glass lens is thus to bend the rays which fall on and emerge from its 2 surfaces.

The action of the bull's-eye lantern, in sending forth the rays in one direction, will explain this principle. As the normal figure of the lens is that to which its powers are due, the polyzonal lens must be considered as such a complete lens with the unnecessary portions cut away.

One great advantage in the decomposition of the original lens is that of diminishing its weight very considerably, and also the greater certainty of the more uniform density of the material from which it is made. There is also another

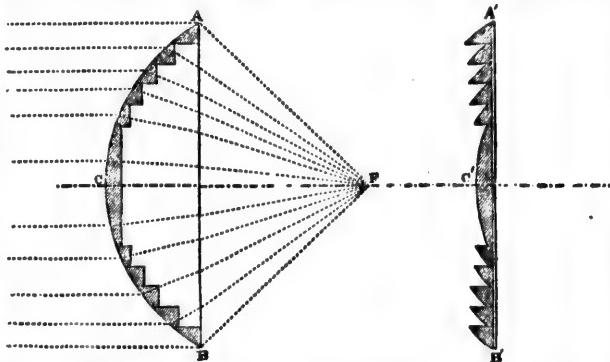
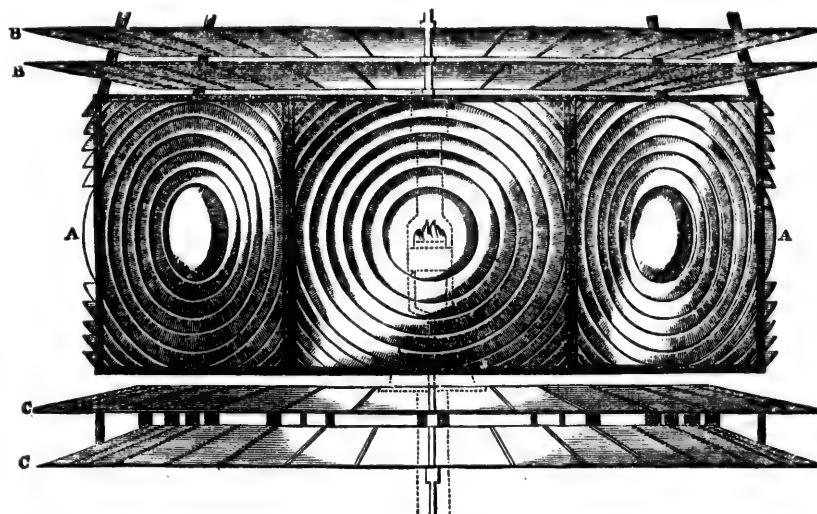


Diagram illustrative of the principle of the polyzonal lens. ABC is a section of an ordinary plano-convex lens, whose focus is at F. As the great thickness of the central portion abstracts much of the light in its passage, the convex surface may be supposed to be cut into circular zones, whose section is as the shaded part of the diagram, and these sections being all placed in one plane, as A'B'C', the latter will have all the optical properties of the former, because the two surfaces are still of the same relative figure.

point in the construction : it affords the means for correcting the aberration for sphericity, a great point in the manufacture of lenses.

The principle of the polyzonal lens being thus explained, the method of applying these to control the luminous rays of a lamp is now to be shown. For this purpose they are built into a square figure, that is, for such lenses as are for revolving lights.

For a *revolving* light, eight of such lenses, which, for a light of the first order, have a focal length of 3 feet 0·25 inches, are formed into an octangular drum which surrounds the central lamp, placed in their common focus. This, then, is the principal portion of the controlling apparatus for a *revolving* light.



The central portion of a first order dioptric revolving light apparatus (the Bermuda light). A A represents the polyzonal lenses, of which there are eight, arranged around the central lamp. The diameter of the octangular prism formed by them is 6 ft. 0·5 in. B B are two of the eight upper series of reflecting zones. These are composed of separate silvered-glass mirrors, and each diminishing in diameter, forming a cupola rising to 5 ft. 6 in. above the flame. C C, two of the four lower series of zones, which are all of the same diameter. The action of these zones will be explained presently.

The lamp which this system is applied to, contains four concentric wicks, (of the respective diameters of 8·57, 1·69, 2·52, and 3·39 inches,) and the oil, by a peculiar construction, either by a mechanical contrivance of small pumps worked by clock-work, or of springs or weights, or else by the pressure of air upon the surface of the oil in the reservoir, is made to flow copiously over these wicks, otherwise the great heat evolved during its combustion would char the wicks. This lamp consumes a pint of sperm oil per hour ; or, according to the computation of the French Commission des Phares, 570 gallons per year. This powerful apparatus being in the centre of the surrounding lenticular system, the ray impinging upon each lens is refracted into a series of parallel, or nearly parallel beams, whose section is the figure of the lens, in the case of the revolving light, or into a continuous zone or band of light around the horizon in the fixed light. M. A. Fresnel, in the construction of the Cordogan dioptric system, used a more complicated system than that above described. A similar arrangement also is in operation at the Skerryvore, and some other stations ; and in these cases every available means is taken to economize the light.

For a *fixed* light, another adaptation of the principle is used. We must suppose

DESCRIPTION OF LIGHTHOUSES.

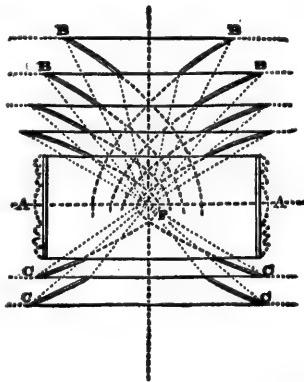
the section of the lens, A B (Diagram on p. 20), to revolve around the focal point, F, and in the same plane, which will produce a series of horizontal belts, having their vertical section similar to that of the lens in its circular form. The effect of this, applied to a central lamp, will be to produce a continuous belt of light in azimuth, instead of a series of beams parallel, or nearly parallel, to the axis of the circular lenses, as in the case of the revolving apparatus. In the focus of this belt, or drum of glass, is placed the lamp, as in the former case.

Originally this cylinder for a fixed light of the first order was made into a polygon of thirty-two sides; but in 1836, the Messrs. Cookson, of Newcastle-upon-Tyne, made one entire, which was the greatest step then achieved in the construction of these lenses.

As the systems we have been explaining will only act upon those beams which are comprised within the angle contained between the focus and the upper and lower edges of the lenses, or about three-eighths of the whole quantity of light, it becomes necessary to economize, as far as possible, those portions which are above and beneath this portion of the apparatus.

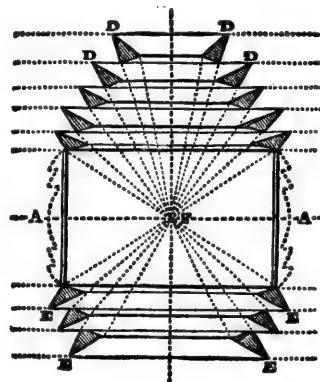
In the early apparatus, the upper portion consisted of a series of catoptric zones, formed of separate pieces of silvered concave glass, arranged in such a manner as to reflect horizontally the beams thrown on to them. The degree of curvature and inclination to the plane of the system was determined, as in the case of the parabolic reflector, by considering their section to be a portion of such parabolas as would, if carried around the focus, form perfect reflectors, as will be readily understood by the subjoined Diagram, where the dotted lines show the form of that portion of the parabola not comprised in the catoptric zone. The same applies to the lower portion of the system.

In the small, or harbour lights, instead of these reflecting mirrors, another plan was first used by M. Augustin Fresnel, that of catadioptric rings, composed of glass, which totally reflected the rays thrown on to them. The action of these zones or rings is explained in the third Diagram.



Catoptric Zones.

F, the focus of the system and the situation of the light; A A, principal lenses; B B, upper reflecting zones; C C, lower reflecting zones. The parabolic curves, of which the section of the zones is a portion, is continued round the focus in the dotted lines.



Catadioptric Zones.

F, the focus, and A A the principal lenses, as in the adjoining diagram; D D, the upper system of totally reflecting prismatic zones, and E E the lower portion of the system. The action of these prisms is explained in the next diagram.

The first example of this catadioptric apparatus was constructed by M. Tabouret,

who was connected with the French Commission des Ponts et Chausées, a short time before the death of M. Augustin Fresnel.

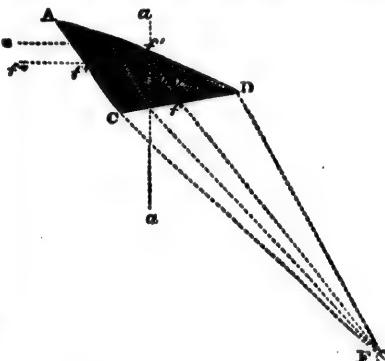
One of the most important improvements which took place in pharology was the adaptation of this accessory on a much larger scale than had previously been supposed possible, by the suggestion of Mr. Alan Stevenson, who, in his construction of the Skerryvore Lighthouse, used every means to render this important edifice most complete in every respect. In conjunction with M. Leonor Fresnel and M. François, jun., the constructors, this apparatus was added to the lower portion of the Skerryvore dioptric light, consisting of five glass zones, which replaced in the ordinary system four horizontal zones, each composed of thirty-two concave mirrors. In a fixed light apparatus of the first order, nineteen of these catadioptric zones replace eleven reflecting zones.

"Nothing can be more beautiful," says Mr. Alan Stevenson, "than an entire apparatus for a fixed light of the first order. It consists of a central belt of refractors, forming a hollow cylinder, 6 feet in diameter and 30 inches high; below it are six triangular rings of glass ranged in a cylindrical form, and above a crown of thirteen rings of glass, forming by their union a hollow cage composed of polished glass, 10 feet high and 6 feet in diameter. I know of no work of art more beautiful or creditable to the boldness, ardour, intelligence, and zeal of the artist."

The divergence of the polyzonal lens is much less than that of the parabolic reflector, being about $5^{\circ} 9'$, owing to the smaller angle subtended by the flame upon the inner surface of the lenses. From this cause, the flash in a revolving light is but of short duration, while that from revolving reflectors lasts much longer, from their greater powers of divergence. To compensate for this, the light from the lenticular apparatus is, within a certain distance, continuous; the upper and lower portions of the system giving a steady light.

FIXED AND FLASHING LIGHTS.—There is one character of light in the French (and other) systems which is peculiar, and requires special mention, as it does not appear to be properly understood by many, and is frequently an important distinction. This, the *feu fixe varié par une éclat* of Fresnel, has this appearance in a light whose period is four minutes: first, a bright fixed light, for above $3\frac{1}{2}$ minutes; then a short, but not total eclipse, for about 10 seconds; then a very bright flash, of much greater intensity than the preceding fixed light; then another short eclipse, and then the fixed light as before. In the larger apparatus the distinction between this and an ordinary revolving light is well marked by the intensity of the fixed light between the brighter flashes, and also especially by the short eclipses preceding and following the bright flash. In the smaller apparatus the bright flash is not so well marked; but the short eclipses will be a clear index to its character.

There are different modes of producing this effect. Fresnel's plan was to have an ordinary fixed light apparatus, around the outside of which two revolving panels of refractors passed in regular succession. These panels consisted of *vertical* lenses, similar to the *horizontal* central belt. They thus received on their inner surface all the light which issued from the central lamp through the fixed lens on the angle



A D C will represent a section of this glass zone, which is so placed with regard to the focus, F, that a ray falling upon it at f will be at such an angle on D A, that instead of passing out, it will be *totally reflected* from that point of incidence, as $f' f''$, and will finally assume the direction, $f'' f'$ of a right angle to the normal, a a, as required. This angle, in passing from glass into air, is about $41^{\circ} 49'$, and a greater angle of incidence gives a reflected ray. In the largest zone, the radius of the arc (the reflecting surface), D A, is equal to 28'46" feet, and the angle, D C A, is equal to $117^{\circ} 28' 42''$.

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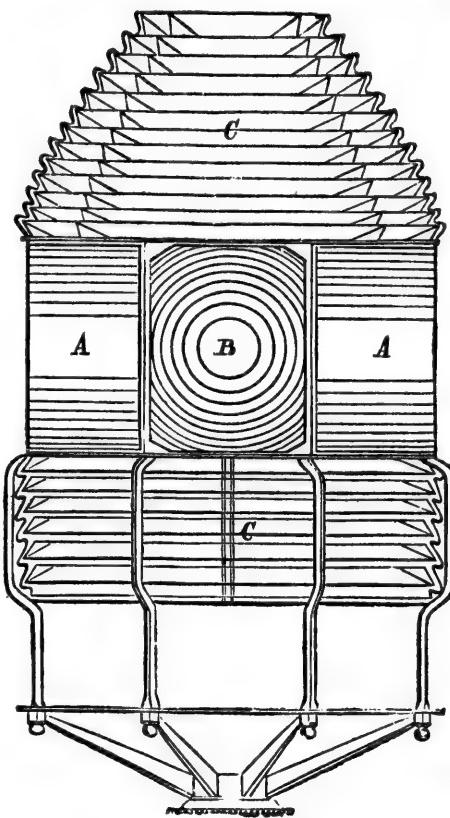
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DESCRIPTION OF LIGHTHOUSES.

which they intercept, and which each refracts into *parallel* beams to the direction it faces as it revolves. Therefore, instead of the rays passing in all directions on that azimuth, a portion of them are collected and concentrated in one direction for the bright flash; and the angle between this bright beam and that emanating from the fixed portion of the apparatus is that which forms the eclipses. The upper and lower zones, of course, are those which maintain a constant light; so that the eclipses in this, as well as in most other lenticular lights, is not total within short distances.

Sometimes the flash is coloured *red*, as in the light on Chausey, Viége Island, Point d'Alpréch, &c.; and in a few cases *green*, as in some of the new Turkish lights, &c.

In another method of producing this effect, constructed by M. Letourneau, the necessity for using two lenses is avoided; and, consequently, the loss of light inevitable in the absorption of a portion in its passage through the glass. The adjoining diagram will explain it. In the central portion of the apparatus B is one of the polyzonal lenses, similar to those figured on page 21; on either side of this is a portion of a fixed light apparatus, shown by the horizontal belts A A. For a fixed light, of course, these horizontal belts are carried all round; and the light appears as a vertical stripe of the breadth of the flame from the top to the bottom of the belt. In the polyzonal lens the light appears to cover its whole surface, and is only visible when in front. The whole apparatus is made to revolve by machinery, and the appearance is as above described: first, the fixed light from the portions on either side; then a short eclipse due to the light being diverted by the great lens; then the full blaze of the lens for 8 or 10 seconds; then another eclipse, and so on.



weather, and is useful in fixing the position of the light in the intervals of the flashes.

It is considered by many, including the great Alan Stevenson, that the fixed and flashing light is not altogether a desirable variety, its appearance being too much like the revolving light; in fact, in our official lists, they were always set down as revolving lights till within the last few years.

In coast lights, when usually the light is not required all round the horizon, that is,

This diagram will also explain another portion of the apparatus, of which a section is given on page 23. The upper and lower portions, C C, in this are the totally reflecting glass zones, which have now almost entirely replaced those figured on page 21, and their action is explained before. It is this part of the apparatus, as before mentioned, which is constantly visible within 10 or 12 miles in fine

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over the land in the rear, there would be a waste of the light from the great lamp, which, of course, suffices to illuminate the whole horizon. In the reflector light this is avoided, as a smaller number of lamps is used. But in the dioptric lights the light is economised by the use of spherical mirrors placed on that side. These spherical mirrors, usually of silvered copper, are formed to a curve, whose radius is equal to that of the focal lenses they are applied to (in first order lights, 3 feet), having the position of the flame as a centre. They thus reflect the rays back again through the flame upon the lenses on the opposite side. Flame, being perfectly transparent, there is no loss of power in this.

This method of economising light was practised, as aforesaid, by Thomas Rogers, about 1788; he used blown glass spherical segments made into mirrors. Mr. Alan Stevenson proposed it in 1834, and MM. François and Letourneau have made them by grinding the glass to the focal curvature.

There are very many other considerations in the economy of Lighthouses that deserve notice, but which would unduly extend this brief description. The excellent works of Mr. A. Stevenson, and of his brother, Mr. T. Stevenson, will afford much instruction.

THE HOLOPHOTAL SYSTEM.

As far as they were applied, the catoptric and dioptric systems acted perfectly; but still there was some waste of light, caused in one direction by the divergence of the instruments, and, in another, by their construction. The consideration of this loss of power led to the next steps in the science of pharology; since that period, some new arrangements have been proposed, by which some of the disadvantages of the dioptric system have been partially avoided. M. Letourneau proposed lengthening the duration of the great flash of the dioptric lens, by dividing it into two portions, and setting each half at a slight angle outwards; this would produce the desired effect, but it must be at the expense of brilliancy. Several other minor improvements also have been suggested, but the main features of the system have remained unaltered.

There is some waste of light in both the systems. In the catoptric it is that angle comprised between the angle formed by the lips of the reflector and the flame and the horizontal ray which strikes the outer edge of the reflector. It is the angle $r P s$, in the upper part of the diagram on page 14. That portion of the light which passes upwards is, of course, lost for useful effect; the other portions may be considered as serviceable. In the year 1849, Mr. Thomas Stevenson, son of Robert, brother of Alan Stevenson, proposed some arrangements which obviate this loss, upon what is termed the *holophotal system*.*

The ordinary paraboloidal reflector is rendered holophotal as follows:—A small portion of the back of the reflector is cut off, behind the parameter, the line $B F D$, which passes through the focus (Diagram 14); for this is substituted a portion of a *spherical* mirror of the same focus. In front of the flame a lens with three diacatoptric rings is added. The action of the spherical reflector is to return all the rays impinged on it back through the flame, and thus on to the posterior sides of the lens and diacatoptric rings. Therefore, all the rays which emerge from the lens, &c., will be horizontal, and the remainder, those impinging on the paraboloid, will also be reflected in the same direction. Peterhead light (1859) is on this principle. The Horsburgh Lighthouse, in the strait of Singapore, is fitted with 9 such holophotal reflectors; three on each face of a revolving frame, each side of which, it is said, gives as much light as five reflectors of the ordinary kind. This was completed in 1851. Another one, on a large scale, is at Hoy Sound, Orkney. A similar apparatus, a red light, was placed at Wick, in Caithness, in 1851.

Fresnel's revolving light system, as at work in the Skerryvore and the Cordouan, with its beautiful but complicated upper system, is rendered holophotal by a very simple means. The zones above and below the main lenses act in the same way as

* "Holophotal;" from two Greek words, signifying "whole light."

the centre, that is, these zones, being made horizontal, are made of segments of circles concentric with the centre of the great lens beneath and above them; and, by the whole apparatus revolving, nearly the whole of the light is projected horizontally in the eight directions of the octagonal prism. Proceeding upon the assumption that the whole of the emitted rays from the central lamp may be made to assume the horizontal direction, Mr. T. Stevenson has made several most excellent arrangements, which, however, we cannot fully describe here. The simplest form is that of a hemispherical metallic reflector, in the focus of which is placed the lamp; before the lamp is a refracting polyzonal lens, of such a section that the whole of the direct rays from the lamp, and the reflected rays from the posterior reflector, are parallelized on their emergence. Carrying this principle to greater refinement, and as it was found that the totally reflecting glass prisms were effective compared with metallic reflections as 140 to 87, a hemispherical arrangement of glass is proposed, which, by refraction and total reflection, produces the same result as the metallic hemisphere in the former instance. The formulæ for the construction of this ingenious apparatus were calculated by Mr. William Swan, F.R.S.E. The glass refracting mirror has one advantage over a metallic mirror in its powers of radiation, as in an experiment the heat in the interior of the apparatus was so great as to cause the oil to boil: an inconvenience, however, which was afterwards obviated mechanically. Very numerous other applications of his principle are also proposed.*

The beautiful holophotal adaptations have been established at several important localities. The magnificent light at Whalsey Skerries, Shetland, constructed by Messrs. Chance, of Birmingham, is perhaps the most powerful apparatus yet in use. Lundy Island, St. Abbs Head (constructing), the Red Sea, &c., have examples of this extending system.

Mr. T. Stevenson has constructed a holophotal arrangement which he calls an azimuthal condensing light, by which the whole light is used down a narrow channel: there are examples at Oronsay and Kyleakin (1857), west of Scotland. Another most ingenious appliance is that at Stornoway, Lewis Island, by which a Beacon on the dangerous Arnish Rock is made to show an *apparent* light, reflected by a peculiar apparatus from a lighthouse on the adjacent point.

As regards the history of the holophotal system, we may refer to Thomas Rogers's plan (1788), before mentioned. Sir David Brewster also proposed an arrangement of lenses, as a burning instrument, in 1812; and the same for Lighthouses, in 1823. Mr. Alex. Gordon, C.E., also constructed a combination of lens and reflector, which economised much of the stray light, in 1847. The carrying this system into full practice, by Mr. T. Stevenson, is as above related.

A first order lenticular apparatus is one of the most beautiful objects in the world. It is a combination of elements, nearly 12 feet high and 6 feet in diameter, constructed with the utmost skill and refinement, and involving in its structure some of the highest principles of applied science.

A first order light apparatus, as above said, is 12 feet high and 6 feet in diameter; and the cost of the lenses alone varies from £1,288 to £1,536; or, with the cost of all apparatus, and light-room or lantern, £2,488 to £2,984.

A second order of light apparatus is 4 feet 7 inches in diameter; the lens costs from £788 to £1,131, or altogether, £1,624 to £2,187.

A third order apparatus, diameter 3 feet 3 $\frac{1}{2}$ inches, costs £378 to £704, or altogether, £882 to £1,456.

A fourth order, or *harbour* light, is 19 $\frac{1}{2}$ inches in diameter; costs from £157 to £255 for the lenses, or £329 to £427 complete.

A fifth order harbour light, 14 $\frac{1}{2}$ inches in diameter, costs £103 to £195, or £257 to £349 complete.

* See "Lighthouse Illumination; being a Description of the Holophotal System," &c. By Thomas Stephenson, F.R.S.E. London, 1859.

The *sixth* order, or smallest size of harbour, is 11½ inches diameter; lens light costs about £70, or complete £216.*

In the early days of the lens lights we were entirely dependent on the French for their construction. The superior character of the St. Gobain *ai. remontré* glass, and the appliances of MM. Soleil, François, Letourneau, Sautter, &c., kept them in possession of nearly all the construction of lenses in use. The only exceptions, in our country, were those made by Messrs. Cookson, of Newcastle-on-Tyne, who, about 1836, made some apparatus, as that of Hartlepool, &c. Later, however, the Messrs. Chance, of Birmingham, have largely entered on this important branch of manufacture, and many beautiful examples are the result of their enterprise.

M. Degrand, of the French Lighthouse Commission, has introduced another process for making the lenses, by forming them of thin sheets of moulded or *cast* glass. This is in use in the Beacon light of Walde Point, near Calais.

CHAPTER IV.

GENERAL REMARKS.

It is very important that the distinctive character of different Lighthouses, and especially of those near to each other, should be plainly marked, and easily recognized. It might be supposed that this was readily and well done, by the alternation of fixed and revolving, at different periods, flashing or double, and even treble lights; but very numerous accidents demonstrate that mistakes frequently occur. During fine and clear weather there is not any difficulty, with ordinary caution. It is the thick haze, snow and storms, driving scud, and all other embarrassments, which, while they tend to throw doubt on the ship's reckoning, also make it difficult to approach an unknown Lighthouse without running into danger. Therefore any distinction, by which one light can be instantaneously distinguished from another, is most useful. The difference in the aspect between the reflector and lens light is one of these, at the sailor's command.

At long distances (say above 10 miles) the flash from the revolving light from the reflector has a sensible disc, and will last a considerable time, 12 or 14 seconds if the revolution is 1 minute; that from the lens light will be whiter, more star-like, and will not last more than 7 or 8 seconds. Another distinction of the latter is, that the light is not totally extinguished between the flashes,—the upper and lower zones keeping constantly illuminated. This secondary light, at favourable times, is visible as far as the horizon of the place, and from 8 to 12 miles, according to the size of the apparatus, in ordinary weather. This is a marked distinction between the two systems, as the eclipse is total from the reflectors, even at short distances. But it must be remembered that the new holophotal system has also nearly total eclipses.

The distinction between the fixed lights, on either system, is not so well marked. The lens equally distributes the light, which is equally bright in all directions: on the other hand, the reflector light is brightest when immediately in front of the reflector, so that a vessel sailing past, when very distant, will find that the light at times gets fainter, till a short distance further brings her into the force of the next reflector.

Very much has been written upon the comparative merits and economy of the two systems. Perhaps the difference at times has been over-rated. At all events, it is

* These prices, which are common to nearly all manufacturers, are taken from the Tariff of Messrs. Chance, Brothers and Co., Birmingham (1860).

DESCRIPTION OF LIGHTHOUSES.

certain, that for fixed lights the advantages are all on the side of the lens, unless the arc illuminated be a small one.

The English reflector revolving lights, as before stated, are not considered inferior to their lens rivals. Many interesting comparisons and details will be found in the Parliamentary Report, the United States Report, and the works of Mr. A. Stevenson.

The *harbour and tide lights*, so numerous in the ensuing lists, have not been specially alluded to in the previous description. Where they partake of the catoptric or dioptric character, it will be understood from what has been said; but in many cases of pier, or small tide lights, they are simply the ordinary street gas lamp, with a coloured pane to distinguish it, or even the inferior hand-lamp.

In many cases, in our own country, these local lights are not worthy the position they occupy; in others, all improvements of construction and efficiency have been used. In most continental countries, as in France, Spain, &c., these local harbour and tide lights being all under the Government direction, they may all be included in the descriptions before given, as applied to the primary lights.

There is no regular system in the tide or harbour signals used in the United Kingdom: however desirable uniformity may be in this and other respects, the diversity of use is of less importance in practice, as the peculiar character of the signals are given for each place, and will be sufficient guide. More extended directions, in connexion with these signal lights, must be found in the special Sailing Directories, and the charts they elucidate.

The *distance* to which the principal lights are visible is generally limited by the horizon. There is no doubt but that they might be seen to very great distances, even 60, 80, or even 100 miles, if sufficient elevation could be gained to view them from. It is considered by many that 250 feet is the maximum height necessary or advisable, which will give an horizon 18 miles distant; and, by ascending the rigging, to 20 miles off. When a light is unduly elevated it is very liable to be obscured by clouds or fogs, and it is frequently a great detriment to those which are so. In the Tables, the height of the flame above the highest tide high-water level is given, so that it is the minimum range of the light; to this elevation 10 feet is added for the height of the deck of the ship above the sea. Besides the increased distance to which low water will cause the light to be seen, the effect of refraction will also sometimes increase their range.

The height of the tower, from base to summit, is frequently given, as it affords a means, by angular measurement by the sextant, of ascertaining the distance of the tower.

Many of the Lighthouses are handsome and commanding structures, and, generally, all modern erections; are made almost as available for day marks as their lights are for night. In many cases they are distinguished by some peculiarity, noticed in the lists, as mentioned on page 7.

When the light is dipping on the horizon it flickers greatly, especially in rough weather, an effect owing to the waves on the intervening horizon. The lights also appear *yellow* when in the neighbourhood of large towns, as Liverpool. This is owing to the smoke of the town. Observations on this point is recommended, as distant lights on land appear quite bright and white during and preceding rainy weather; while a yellow or reddish tinge indicate, almost certainly, a continuance or approach of fine weather.

It may readily be comprehended, that if the refinement of economising the light were carried to so great an extent without vertical divergence, the effect would be to send forth the light in such a thin disc that it would be invisible to a distant ship unless she were exactly on that part of the ocean which this thin disc of light touched. Some aberration is, therefore, absolutely necessary.

But this point has also been urged by Mr. T. Stevenson (in 1841), as one that might be made useful, as a light might be made to be visible only over a dangerous reef, or in a safe channel. Therefore a ship approaching such danger would be warned when to put about by its becoming visible, or by losing sight of it. It is said that a light of this character was in use at Beachy Head, but the particulars have not been preserved.

It has frequently happened that a Lighthouse on a perpendicular cliff has not shown the light to ships passing close underneath, and in some cases with very disastrous consequences. In these circumstances it is almost imperative that the light should have a high degree of divergence in the lower portion of the apparatus. A very useful application of this has been made in some few Lighthouses, (as in Ballycotton, S. Ireland,) of having the lower panes of the lightroom made of red glass, so that a ship approaching too near the land will be warned of it by the light changing to red.

The masking of lights for the purpose of clearing the navigation of different channels, is effected in the same way as the ships quarter-lights are, as is most usefully carried out in Liverpool Bay. A different coloured ray is also most serviceable, as the bright ray from the Maplin, which points out a turn in the channel, or in other cases where the change of colour can be made a beating mark. All these points, however, are familiar to the sailor. In the preceding notices are given only the leading features, sufficient to show what the general principles are as applied to our subject. But it may be affirmed, that almost every variety of circumstance and requirement in the Lighthouse System has been the subject of profound study; and so numerous are the plans and inventions in connexion with all branches of them, that the mere enumeration of them would be a bulky list.

The English lights are lit at sunset, and extinguished at sunrise. The Scotch have made a saving by doing so at darkening and dawn. In all cases of the public lights, of all countries, the strictest supervision and most careful management are used to render them in the highest degree efficient.

The ancient Corporation of the Trinity House of Deptford Strand has had, as is well known, the charge of the British Lighthouse System. This is one of the very few institutions (if there be another), which dates from a mediæval period, which has well preserved it importance and useful character, through all changes, to the present day. That it has done so, the recent Report of the Royal Commission, 1861, will testify.

"The above evidence then goes to show that the quality of British lights (speaking generally) is equal to the quality of lights in any part of the world; and the testimony is especially valuable because the men who give it are mariners,—those best able to judge of the appearance of the light; and, as appears from their evidence elsewhere, generally knowing nothing about the manner in which the light is produced. As one witness remarked, 'They don't know the ropes,' C. and D., (catoptric and dioptric,) but most of them think that first-class British lights, speaking generally, are as good as most first-class lights which they have seen abroad, and better than many."

The Trinity Corporation, which has developed our English system, under the advice and assistance of the most eminent engineers and philosophers of all periods, existed in the reign of Henry VII., as a respectable Company of Mariners in the College at Deptford, having authority by Charter to prosecute persons who destroyed sea-marks, &c.; and Henry VIII., in the sixth year of his reign, May 20, 1514, formed them into a perpetual Corporation, by the style and title of the "Master, Wardens, and Assistants of the Guild or Fraternity of the most glorious and undivided Trinity, and of St. Clement, in the parish of Deptford Strand, in the county of Kent."

This Charter was confirmed and altered by Edward VI., Queen Mary, Elizabeth, and James I. The Charter of James I. settled this constitution of the Corporation,

and such it continues. The Charter was dissolved in 1647, but was renewed by Charles II. on the Restoration, and the disposal of the funds was settled partly for charitable purposes. The Charter was surrendered to Charles II., and renewed by his successor in 1685; and the charitable uses of the funds of the Corporation were again settled. These funds were derived from various charges, such as pilotage, lastage, loadmanage, ballastage, &c.

The interest which the Trinity Corporation represented having, by the extension of commerce, grown into great magnitude, the Government interfered and altered some of their privileges at different periods, especially in 1854, when the Board of Trade partook of the supervision.

In *Scotland*, the Commissioners of Northern Lighthouses are the acting body, and were incorporated by the Act 38th Geo. III., c. 58. They have had the benefit of the special services of the family of Stevensons, often noticed previously.

In *Ireland*, the Ballast Board of Dublin acts in all Lighthouse matters. (See the 23rd Geo. III., c. 19.)

Besides these three public bodies there are very numerous local authorities, which deal with local lights. The principal among these are the Liverpool Board, the Trinity Houses of Newcastle, Hull, &c. The number of these separate bodies is very great; as, for the 402 Lighthouses in Great Britain, there are, at least, 174 different authorities to direct them.

The Colonial lights are chiefly under the control of the Board of Trade.

Like many other important interests, this has suffered from over legislation, as the Chairman of the Commission of 1861 says—"It is difficult to discover the necessity for that cumbersome system which now exists, viz., *a single government* (the Board of Trade) for Lighthouses in the British possessions abroad; *a double government* for the Lighthouses under the Trinity House; *a triangular government* for the Scotch Lighthouses and for local lights in England; and *a quadrilateral government* for the Irish Lighthouses and for local lights in Scotland and Ireland;—a system which can scarcely be expected to find favour in the present day."

In *France*, the Lighthouse service is under the ministry of Public Works, and a special Commission, called "Commission des Phares;" which body consists of naval officers, marine engineers, hydrographers, members of scientific bodies, and other gentlemen, distinguished for their scientific attainments in various professions, all of which have to do with branches of science connected with coast illumination. The general conduct of the service is under an officer called Directeur General des Phares, who is an engineer, and has other engineers under him.

In the *United States* of America, the lights are under one Central Board, constituted in 1852, and composed of a member of the Government, engineer officers, and officers of the army and navy, and civilians of high scientific attainments.

In *Sweden*, the lights are under the Admiralty, and managed by a director and officers who have military rank, and engineers.

In *Norway*, the service is under the Royal Marine Department.

In *Turkey*, it is under the Admiralty; and the system is now in course of development.

In *Hanover*, the service is under the Director-General of Waterworks.

In *Hamburg*, they are under the Committee for Harbours and Navigation.

In *Spain*, the system of administration is the same as in France; and the full development of the system is now in progress. The lights, &c., are under the department of Public Works, and under a permanent Commission composed of

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GENERAL REMARKS.

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engineers of superior rank of the Corps of Roads, &c., and naval officers; and the captains of ports are instructed to suggest improvements and report on the lights.

In *Denmark*, the service is under the Ministry of Marine, entrusted to one Light Engineer and two Buoy Inspectors.

In *Russia*, the superintendence is dependent from the Hydrographical Department.

In *Holland*, the management of Lights, Buoys, and Beacons rests with the Minister for the Marine, under whom are an Inspector-General and seven Inspectors.

In *Belgium*, the construction of Lighthouses is under the Minister of Public Works; but when built they are handed over to the general direction of the Navy, which is under the Minister for Foreign Affairs.

In *Austria*, the superintendence of all the Lighthouses, Buoys, and Beacons belongs to the Imperial Royal Admiralty. The Deputies of the Exchange, at Trieste, attend to Lighthouses, — their erection, management, collection of dues, &c.

In conclusion, an inspection of these most useful monitors to the sailor is recommended to him. He will then see that the beauty of the apparatus, the discipline, order, cleanliness and perfection of everything connected with them are not exceeded by their utility.

EXPLANATION OF THE TABLES.

NAME AND CHARACTER OF LIGHT—FIRST COLUMN.

The principal coast lights are given in capitals, as N. FORELAND. Secondary lights in smaller capitals, as SHOREHAM HARBOUR. Tide lights in italics, as *Ramsgate*. The character of the light follows its name.

GEOGRAPHICAL POSITION—SECOND COLUMN.

The latitudes and longitudes here given are presumed to be accurate, within less than 1', for all the coasts of the Atlantic Ocean and its Seas. In other parts of the world it may vary somewhat more; but there is no great discrepancy, such as would lead to serious consequences, by taking any one of them as a point of departure.

DESCRIPTION OF THE LIGHT, &c.—THIRD COLUMN.

In this, any peculiarity of the light, or period of a Tide light, is noticed; and also the direction of double lights. In many cases the bearing of two lights when in one will lead clear of a danger, as the S. Foreland in one, W. by N., clears S. end of the Goodwin, &c. Special directions will explain this.

DESCRIPTION OF APPARATUS—FOURTH COLUMN.

In this, the signs used to indicate the sort of light apparatus in use in each case:—

- signifies a catoptric, or reflector light. (See page 14, &c.)
- 1 a, 2, 3 d, &c., indicate dioptric, or lens lights, the figure showing the order or size, 1st, 2nd, 3rd, to 6th order. (See page 26.)
- a, a fixed lenticular light. (Page 22.)
- b, a revolving lenticular light. (Page 21.)
- c, a fixed and flashing light. (Page 23.)
- d, a holophotal light. (Page 25.)

These figures and letters will serve to explain the peculiarities of the Lenticular System, as in operation therein.

HEIGHT ABOVE HIGH WATER—FIFTH COLUMN.

This gives the height of the *flame* in feet above the highest tide level, consequently it is its minimum height, and is increased by the tidal range of the place. The height of the Lighthouse itself, from base to summit, is given sometimes in the third column.

VISIBLE IN MILES—SIXTH COLUMN.

This gives the minimum distance to which the light can be seen, in clear weather, from a height of 10 feet above the sea level. But in the case of the principal lights this but imperfectly represents their range, as they could be seen at any distance attainable by increased elevation. In the use of *coloured* lights this range is given according to their presumed power.

YEAR ESTABLISHED—SEVENTH COLUMN.

The date of the first exhibition of the light is usually given; but its character, &c., may have been frequently changed in the interval.

LIGHTHOUSES.

ENGLAND.

Thames Mouth.

Name and Character of Light.	Lat. N. Long. E. ○	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
RIVER THAMES Northfleet	.....	White light in fairway; red over anchorage in Gravesend Reach and Broadness.....	●	..	..	1859
Hope Point Fort	.....	A single lamp for Colliers.....	...	..	..	1852
Mucking Flat, Pile Light House	.....	Bright East of N.E. by E., red to W.; also red ray toward Blyth buoy, and red N. of fairway in Sea Reach.....	2a	40	11	1849
Chapman Head	.....	Bright in fairway channel, red to N. A fog-bell	2a	40	11	1849
Southend Pier-head	.....	Red fixed light.....	...	..	..	1840
Sheerness	.....	Red gas-light on Garrison Pt. ....	...	32	5	1859
NORE LIGHT-VESSEL One br. rev. It. $\frac{1}{2}$ min.	51 29. ○ 48.	In 3 fathoms at East end of the Nore Sand	●	38	10	1734
GIRDLER LT.-VESSEL One br. rev. It. $\frac{1}{2}$ min.	51 29. I 7.	In 3½ fathoms W. Girdler Sand at W. entrance of Prince's Chan.	●	38	10	1848
PRINCES CHANN. LT. VES. One red rev. It. 20 secs.	.....	In 3½ fms. N. side of Channel, between Girdler and Tongue Light-Vessels	●	38	10	1856
TONGUE LIGHT-VESSEL Upp. br., low red, F. Its.	51 29. I 19.	In 10 fathoms at E. Tongue Sand one red ball. Lights at unequal heights	●	38	10	1848
Herne Bay Pier	.....	Fixed light at Pier-head .....	...	..	..	1857
Margate Pier One red fixed light	51 24. I 23.	At West end of Pier, also a small light on Jarvis landing-place	●	85	10	1829
MOUSE LIGHT-VESSEL One bright fixed light	51 32. I 0.	In 4 fathoms, at W. end of Sand	●	38	10	1838
MAPLIN PILE LIGHTHO. One red fixed light	51 35. I 3.	Painted red, light not vis. over the sand; a bright ray to S. $\frac{1}{4}$ W.	2a	36	10	1838
SWIN MIDDLE LT.-VES. One br. rev. It. 1 min.	51 39. I 7.	In 4 fathoms at West end of Sand	●	38	10	1837
GUNFLEET PILE LT. HO. One red rev. It. 2 min.	51 45.8 I 20.	On S.E. side of Sand; keep $\frac{1}{4}$ mile off and do not pass to N.	●	41	9	1850
SUNK LIGHT-VESSEL One bright fixed light	51 46.7 I 28.	In 10 fathoms in fairway of East Swin	●	37	10	1802
KENTISH KNOCK LT.-VES. One br. rev. It. 1 min.	51 40.8 I 40.5	Has two red balls vertically. In 11 fms. on E. side of Sand ..	●	37	10	1840
GALLOPER LT.-VES. Two br. fixed lights	51 45. I 56.	In 20 fms. on E. side of Sand; lights horizontal	●	36	10	1803

Name and Character of Light.	Lat. N. Long. E. ○	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
NORTH FORELAND One bright fixed light	51 22.5 1 26.8	White tower 78 ft. high. A strip of red lt. to E. end of Margate Sand	1a	184	19	1636
Ramsgate Tide Lights One red, two green lts.	51 20. 1 26.	While 10 feet. The low green lt. is changed to red with 10 feet. a red tide ball by day	4a	37	6	....
GOODWIN LT.-VESS.	51 19. 1 35.	Off the N. end of the Goodwin Sands, in 9 fathoms	●	28	10	1793
GULL STREAM LT.V.	51 17. 1 30.	On the W. edge of the Goodwin Sands, in 8½ fathoms	●	14	7	1809
SO. SANDHD. LT.VES.	51 10. 1 28.	Off the S. end of the Goodwin Sands, in 13 fathoms	●	38	10	1832
SOUTH FORELAND Two br. fixed lights	51 8.4 1 22.4	In one W. by N., 1,347 feet apart	1a	372	25	1793
DOVER One green light Red Tide Lights Blue lighton Admiralty Pier	51 7. 1 19.	N. Pier: one red lt. while 7 feet. S. Pier: one red lt. while 7 to 10 ft.; two red lts. while 10 to 13 feet. The green light only toward the entrance	● ..	275	22	1842 1852
Folkestone Tide Light	51 5. 1 11.	One fixed red light, while 10 feet	●	36	6	1810
VARNE LT.-VESSEL One red, quick revol. lt.	50 56. 1 18.	In 16 fathoms at W. end of the Shoal	●	36	10	1860
DUNGENESS One bright fixed light	50 54.8 58.3	A red tower on the point. Fog bell	1a	92	14	1789
Rye Tide Lights Two bright fixed lts.	50 57. 0 44.	On N. side of the entrance while 10 ft.; in one N. by W. 540 feet apart .....	..	26	4	....
HASTINGS One bright, one red lt.	50 52. 0 36.	In one, N.N.E., 508 feet apart, to direct the fishermen (September 29 and March 25) .....	..	30	4	....
Eastbourne	50 45. 0 17.	A lamp in the fishing season .....	..	10	2	....
BEACHY HEAD A br. rev. light, 2 min.	50 44.2 0 12.9	A white lighthouse, 47 feet high, on summit of Belletout Cliff ..	●	285	22	1828
NEWHAVEN A br. fixed lt. & Tide Lt.	50 47. 0 4.	On the W. pier. The tide lt. red between 10 and 13 feet; bright above 13 feet	●	28	8	....
BRIGHTON CHAIN PIER.	Lat. N. Long. W. 50 47. 0 4.	One green fixed light .....	..	35	10	1824
SHOREHAM HARBOUR A br. fixed lt. and red Tide Light	50 50. 0 15.	On central pier, bright Tide light while 11 foot, but red at H. W.	4a	42	10	1825
Littlehampton	50 48. 0 32.	A fixed red light on E. pier	●	30	9	1848

ENGLAND.

LIGHTHOUSES.

South Coast. 35

Name and Character of Light.	Lat. N. Long. W. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
OWERS LT.-VESSEL One bright fixed light	50 39.7 0 39.9	On the S.E. end of the Owers Shoal, in 19 fathoms	●	38 | 10	1788	
BEMBRIDGE LT.-VESSEL Two bright fixed lights	50 41.7 1 1.7	Near the Nab Rock, off Bem- bridge Point, in 5 fathoms	●	38 | 10	1812	
ST. CATHERINE'S One brilliant fixed lt.	50 34.5 1 17.8	A handsome stone tower, 105 feet high	1a	178 | 18	1840	
WARNER LIGHT-VESSEL One br. rev. lt. 1 min.	50 43.8 1 4.	In 13 fathoms, on the Eastern part of the Shoal	●	38 | 8	1854	
RYDE PIER	.....	A bright fixed light	5a	21 | 12	1852	
SOUTHSEA CASTLE One red fixed light	50 46.6 1 5.2	A strong red light on Castle. Shows green from W. of the Spit Buoy	●	31 | 9	1822	
SOUTHAMPTON PIER Two fixed red lights	50 53.7 1 24.4	In one, lead up the Channel. Also two red lts. at the Docks in one lead up .....	..	.. | ..	1841	
CALSHOT LIGHT-VESSEL One bright revol. light 1 min.	50 48. 1 16.	Off Calshot Castle, in 3½ fathoms	●	32 | 9	1842	
YARMOUTH CASTLE One fixed light	.....	Red light in centre leads in; bright or green, outside .....	..	12 | ..	1857	
NEEDLES OUTER ROCK One fixed light	50 39.7 1 34.5	Shows RED (except between W. and W.N.W.), when it shows WHITE. Shows WHITE also to N.E. by E. ¼ E. A faint lt. inside Warden Ledge Buoy. Fog bell.	1a	80 | 9	1859	
HURST BEACH Two bright fixed lights	50 42.4 1 32.9	In one, N.E. by ½ E., 755 feet apart. Another light in the low lighthouse shows only up the Solent	●	66 | 12	1812	
● | 29 | 9 | 1786			●	29 | 9	1786	
POOLE Two red lights	50 41. 1 58.	In one, N. ½ W.; 786 feet apart on N. side of entrance. Also four lights inside	●	37 | 6	1848	
Swanage Pier	.....	One fixed light intended .....	..	.. | ..	1861	
WEYMOUTH One red fixed light	50 37. 2 26.	On the S. pier head .....	..	23 | 21	1853	
PORTRLAND High lt., br. and fixed Low lt., br. and fixed	50 31.3 2 27.3	White towers, 32 and 86 ft. high near the Bill. In one, N.N.W. ¼ W., 1500 feet apart	1a	222 | 19	1716	
PORTRLAND BREAKWATER One fixed red light	.....	On the end of the Stage .....	..	145 | 16	1789	
PORTLAND BREAKWATER One fixed red light	.....	On the end of the Stage .....	..	30 | 9	1851	
SHAMBLES SHOAL LT.VES. One fixed light	.....	On E. end of Shoal, in 15 fms.	●	38 | 10	1859	
Lyme Regis Tide Lights One red, one green light	50 43.5 2 55.9	From half flood to half ebb. In one, N.W. ½ N., 825 ft. apart	..	11 | ..	1863	
			..	21 | 4		

Name and Character of Light.	Lat. N. Long. W. o /	Description, &c.	Description of Apparatus	Height above H.W.	Visible in Miles.	Year established
TEIGNMOUTH Two red fixed lights	50 33. 2 28.	One on a limestone tower on S.W. end of Denn; other on a house	● |	31 | 61	1845	
BRIXHAM One red fixed light	50 24. 3 30.	On an iron stand on the pier head .....	● |	20 | 6	1839	
Torquay Pier Head	50 27.5 3 31.	One fixed red light	... |	15 | 5	1852	
DARTMOUTH One red fixed light	50 20. 3 33.	W. side of entrance .....	● |	80 | 10	1857	
START POINT One brilliant revolving light, visible every minute	50 13.3 3 38.5	A white tower, 94 feet high. A fixed lt., 192 ft. high, is also vis. from tower, when it bears S. of W.S.W. A bell in fogs	1a |	204 | 19	1836	
PLYMOUTH BREAKWATER One bright and one red light	50 20.4 4 9.5	On W. end; bright to seaward, but red E. of N.E. & E. from it. A lower br. lt. is seen when the channel is open. A bell during fogs	2a | .. |	63 | 48	9 | 1844	
PLYMOUTH HARBOUR One bright fixed light	50 22. 4 7.	A tower, 20 feet high, on the W. Barbican pier head .....	● |	29 | 6	1822	
EDDYSTONE One brilliant fixed lt.	50 10.8 4 15.9	An admirable red and white stone tower, 89 ft. above foundation on the rock, which covers 14 ft. at high water. Bell in fogs	2a |	72 | 13	1759	
FALMOUTH One rev. lt. in 20 secs.	50 8.6 4 59.5	A white tower, 62 feet high, on St. Anthony's Point .....	● |	72 | 12	1835	
LIZARD Two brilliant fixed lts.	49 57.6 5 2.1	Two white towers, each 61 feet high, W. & N. and E. & S., 223 feet apart, on the Lizard Cliff	● | ● |	229 | 20 232 | 20	1751	
WOLF ROCK One light, proposed	49 56.7 5 48.2	(Proposed, on the rock.)	... |	.. | ..	1861
Penzance Tide Light A fixed red light, while 15 ft. inside; green while less	50 7. 5 31.	A white building, 22 feet high, on the S. pier head. By day, a ball while 15 feet	5a |	33 | 9	1855	
LONGSHIPS One brilliant fixed lt.	50 4.1 5 54.7	A white square tower, 51 feet high .....	● |	79 | 14	1795	
SEV. STONES LT. VES. Two bright fixed lights	50 32. 6 7.3	On the E. side of the rocks, in 40 fathoms. Two red balls	● |	20 | 10	1841	
SCILLY One br. revol. lt. every minute	49 53.5 6 20.7	A white tower, 74 feet high, on the summit of St. Agnes' Island .....	● |	138 | 16	1680	
BISHOP ROCK One fixed bright light	49 52.5 6 26.6	On the S.W. rock. A noble stone tower, 147 feet high....	1a |	110 | 16	1858	

Name and Character of Light.	Lat. N. Long. W. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
<i>St. Ives Tide Light</i> One bright fixed light, while 10 feet	.....	On the pier head. Lighted from 1st September to 30th April	•	23	7	1831
<i>Hayle Tide Lights</i> Two fixed bright lts.	.....	N. 25° E. and S. 25° W., 207 ft. apart, while 12 foot water.....	• 59	81 6	1840	
GODREVY One flashing lt., 10 secs.	50 14. 5 24.	On the Island. A bell in fogs..	1c	120	15	1850
TREVOSE HEAD Two bright fixed lights	50 32.9 5 2.1	The lower light is 50 feet to sea- ward of the upper	1a	204 129	20 17	1847
Bristol Channel.						
LUNDY ISLAND Upper lt., rev. in 2 min. Lower fixed light	50 10.0 4 40.3	In one tower, 96 feet high. Low light visible to W. between N.N.W. and W.S.W.	1b •	540 470	31	1820
<i>Bideford Harbour.</i> Two bright fixed lts.	51 4. 4 12.	In one, S.E. $\frac{1}{2}$ S., lead over bar; from $\frac{1}{2}$ flood to $\frac{1}{2}$ ebb. A red ball by day	• 40	86 14	1820	
ILFRACOMBE One red fixed light	51 13. 4 7.	From the Lantern Hill (Michael- mas to Lady-day)	•	100	15	....
BURNHAM, OR BRIDGEW. Upper light, intermit- ting Lower light, fixed	51 14.9 2 59.9	Upper tower white; lower with black streak, E. by S. $\frac{1}{2}$ S., 1,500 feet apart. Upper light bright, $3\frac{1}{2}$ min., obscured $\frac{1}{2}$ min.	• 23	91 9	16	1832
AVON One bright fixed light	51 30.0 2 42.2	White tower, 65 feet, on the E. side. A red ray to N.W. $\frac{1}{2}$ N.	2a	70	13	1840
ENGLISH AND WELSH GROUNDS LT.-VESSEL One br. rev. lt. 1 min.	51 26.5 2 58.	On S. side of Bristol Channel, in 5 fathoms; a red ball, gong, gun, &c.	•	38	10	1838
FLATHOLM One bright fixed light	51 22.5 3 7.	A white tower, 89 feet high, on the S. point	1a	156	17	1839
USK RIVER One bright, one red lt.	51 32. 3 0.	W. side of entr., the red lt. 20 ft. below; red light also to N.E.	•	39	10	1821
CARDIFF	51 28. 3 10.	On the pier (intended) .....	•	...	...	1860
NASH POINT Two bright fixed lts.	51 24. 3 33.	White towers, 1,000 ft. apart, S.E. by E. $\frac{1}{2}$ E., & N.W. by W. $\frac{1}{2}$ W.	• 122	167 16	18	1832
SWANSEA HARBOUR One red fixed light	51 37. 3 56.	While 8 ft., black ball by day. Also two red or green lts. on new S. Docks .....	..	28	9	1803
MUMBLES One bright fixed light	51 34. 3 58.2	A white tower, 56 feet high, ad- joining the Fort	•	114	15	1798
HELWICK LIGHT-VESSEL One br. rev. lt. 1 min.	51 31. 4 24.	In 16 fathoms, off the W. end of Sand, a red ball, gong, gun, &c.	•	38	10	1846
Llanelly Two fixed lights	51 40. 4 10.4	One on S. end of Breakwater, one on Whiteford Point, from $\frac{1}{2}$ flood to $\frac{1}{2}$ ebb	•	36	7	1850
				..	..	1854

Name and Character of Light.	Lat. N. Long. W. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
Pembrey Harbour One fixed light	51 41. 4 15.	While 10 feet water	●	35	9	....
Saunders foot, S. Pier	.....	One red lt. or yell. ball while 8 ft.	...	15	...	....
Tenby Pier Head	.....	One red tide light, for steamers, &c.	...	14	3	1856
CALDY ISLAND One bright fixed light	51 37.9 4 41.	A white tower, 56 feet high, S. part of Id. ....	● | 210	19	1829	
ST. ANN'S POINT. Two bright fixed lights	51 40.9 5. 10.5	Two white towers, 75 and 39 ft. high, 610 ft. apart, N. by W. & W.	● | 192 1a | 159	10 17	1841	
SMALLS One bright fixed light	51 43.2 5 40.1	Timber, painted red. A new granite tower, 141 ft. high, building, 1861, for a second light..	● | 70 1a | 125	13 16	1778 1861	
Wales.						
S. BISHOP ROCK One br. rev. lt. 20 secs.	51 51. 5 25.	A white tower, 36 feet high	1b | 144	18	1839	
CARDIGAN BAY LT.-VESS. One rev. red lt., 30 secs.	.....	Between South Bishop and Bardsey Id. lighthouses .....	● | 40	9	1860	
Aberystwith	.....	Two fixed lights occasionally ..				
BARDSEY ISLAND One bright fixed light	52 45. 4 47.9	A square white tower, 99 feet high	1a | 129	17	1821	
CAERNARVON One red and one bright fixed light	53 8. 4 24.7	Red light on Llanddwyn Point; bright light on pier head ....	● | 50	5	1845 1868	
SOUTH STACK ROCK One br. rev. lt. 2 min.	53 18.4 4 41.9	White tower, 84 feet. During fogs a rev. light is shown at 40 feet. Bell, gun, &c. ....	● | 201	19	1809	
HOLYHEAD HARBOUR One bright fixed light	53 18.8 4 37.1	On the old pier head; a red light also to N.N.E.; a bell and gun in fogs. Also two temporary red lights on jetty .....	● | 44	11	1820	
— Breakwater Lt.-Ves.	.....	One red lt. near E. end of works	● | 20	4	1850	
SKERRIES One bright fixed light	53 25.2 4 36.4	A white tower, 75 feet high, on the highest island	1a | 117	15	1803	
AMLWCH PORT	53 25. 4 20.	One br. light when practicable	● | 26	9	1817	
LYNUS or ELIAN PT. One intermitting light	53 25. 4 17.3	A white building, 36 feet high. Lt. vis. 8 secs.; eclipsed 2 secs.	● | 128	16	1835	
MENAI	53 18.9 4 2.3	One red fixed light on Trwyn-Du Point	1a | 61	10	1837	
AIR POINT One br. or red fixed lt.	53 21.4 3 19.2	A pile lighthouse; lt. is red only within Hoyle Sand; fog bell	● | 42	9	1844	
LIVERPOOL N.W.LT. SHIP Three br. fixed lights	53 27. 3 17.4	In 7½ fms. off the Horse and Helbre Channels; burns a blue lt. every 2 hours; a black ball. In fogs, a bell and gong alternately ..	● | 36	10	1814	

Name and Character of Light.	Lat. N. Long. W. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
HOYLAKE Two br. fixed lights	53 23.7 3 10.7	In one, S.W. by S., 1,200 feet apart, near the Church	●	55 31	13 11	1763
BIDSTON One bright fixed light	53 24. 3 4.4	A stone tower, 68 feet high, on the hill	●	228	23	1771
LEASOWE One bright fixed light	53 24.8 3 7.5	On the shore, between the Mersey and Dee.....	●	94	14	1763
BLACK ROCK One rev. lt. 1 minute br. twice; red once	53 26.6 3 2.	A white tower, 94 ft. high. Also a <i>fixed light</i> , while 11 ft., down Rock Channel and up Mersey	●	61	14	1830
CROSBY LIGHT-VESSEL One yellow fixed light	.....	In 44 feet off the N.E. elbow of the Burbo Bank; a <i>red ball</i> ..	●	29	8	1840
FORMBY LIGHT-VESSEL Two fixed lights	53 31.7 3 10.8	At the elbow of Crosby and Queen's Channels, in 25 feet	●	30 24	8	1834
CROSBY LIGHTHOUSE One red fixed light	53 32.3 3 3.9	Near the Point	●	95	12	1856
RIBBLE RIVER Upper, br.; lower, redlt.	53 44.6 3 1.1	In the same tower, on Stanner Point.....	4a	72 35	12 9	1818
<i>Lytham Harbour</i>	53 44.2 2 58.5	One fixed light .....	●	...	...	....
<i>Fleetwood</i> Two bright fixed lights	53 55.6 3 0.4	N. and S., 850 feet apart; shown while 9 feet	●	90 30	13 9	1841
WYRE RIVER One bright fixed light	53 57.2 3 1.8	A pile lighthouse, on N.E. of N. Wharf Bank; fog bell .....	..	30	10	1840
Lune River Two bright fixed lights	53 59. 2 53.	On Cockerham Point and Plover Scar Rock, while 8 feet water	● ●	54 20	9	1847
CLARK WHARF SPIT One fixed red light	54 1.3 3 0.	On red piles. A ball by day; a green light while 8 ft. Fog bell	●	30	6	1854
POULTON PIER	54 4.3 2 52.5	One fixed bright light	6a	48	8	1851
WALNEY ISLAND One br. rev. lt. 1 min. One red fixed light	54 2.9 3 10.6	On the S. point. In one, N.W. by W. $\frac{4}{4}$ W., 340 yards apart. A red lt. also on Railway Viaduct	●	70	13	1790
ST. BEES HEAD One bright fixed light	54 30.8 3 38.	A white tower, 43 feet high	●	333	23	1821
WHITEHAVEN 1. One rev. lt., 2 min. 2. Two fixed lights	54 33.2 3 35.8	1. A white tower, 37 ft. high, on W. pier. 2. Red lt. on Old Quay while 9 feet. Blue lt. on N. pier .....	..	47	11	1823
Harrington Tide Light One fixed light	54 37. 3 34.	On the pier head, while 8 feet water. Red ball while 8 feet	●	44	11	1848
Workington Tide Lights Two fixed lights	54 39. 3 35.	On the ends of St. John's and Wooden piers, E. and W., 330 feet apart, while 8 feet water	..	53	11	1825

Name and Character of Light.	Lat. N. Long. W. o ,	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
MARYPORT One br., one tide light One green, one red light	54 43. 3 30.3	Fixed lt. on Outer pier head. Tide light, while 8 ft., on Inner pier. Red lt. on Starboard side, and green lt. on North Tongue....	4a ..	51 ..	12 10	1796 1856
SOLWAY LIGHT-VESSEL One red light	54 48. 3 32.	In 4½ fms. in Robin Rigg Channel. Black ball; a bell in fogs	● ..	25 ..	6	1841
LEE SCAR One bright fixed light	54 51.8 3 24.7	On piles on the rocks. A bell in fogs .....	.. ..	25 ..	6	1841
SKINBURNESS One red light	54 52.5 3 23.	A white wooden building, 32 ft. high, on Silloth Point .....	.. ..	40 ..	9	1841
Carlisle Port Tide Light	.....	A lamp on the pier head .....	.. ..	.. ..	..	1841
Isle of Man.						
POINT OF AYR A rev. lt., br. and red, 2 min.	54 24.9 4 22.	A stone tower, 90 feet high, $\frac{1}{2}$ mile S.W. of the Point	● ..	103 ..	15	1818
Peel Harbour	.....	Bright lt. on E. side of entrance ..	.. ..	21 ..	8	1911
CALF OF MAN Two br. rev. lts., 2 min.	54 3. 4 50.	Two stone towers, 560 feet apart, N.E. $\frac{1}{2}$ E., and S.W. $\frac{1}{2}$ W. ..	● ..	375 282	25 23	1818
PORT ST. MARY	.....	One bright light on pier head ..	● ..	25 ..	9	1812
CASTLETOWN HARBOUR	.....	One fixed lt. on New pier head ..	.. ..	32 ..	8	1849
DERBY HAVEN Two fixed lights	54 5. 4 36.	On Fort Island, and S.W. end of Breakwater .....	.. ..	50 14	6 2	1850
DOUGLAS One bright fixed light	54 9. 4 28.	A brown stone tower, 65 feet high, on Douglas Head .....	.. ..	104 ..	15	1832
DOUGLAS HARBOUR	.....	One fixed lt. on the N. pier head ..	.. ..	34 ..	6	1796
RAMSEY HARBOUR	.....	One fixed red lt. on S. pier head ..	● ..	28 ..	10	1845
BAHAMA BANK L.V. Two bright fixed lights	54 20. 4 12.	In 11 fathoms, on the S.E. part of the Bank	● ..	20 33	10	1848

ENGLAND.

LIGHTHOUSES.

East Coast. 41

Year established
1796
1856
1841
1841
1841
1841
5 | 1818
8 | 1811
25 | 1818
23 |
9 | 1812
8 | 1849
6 | 1850
2 |
15 | 1832
6 | 1796
10 | 1845
10 | 1848

Name and Character of Light.	Lat. N. Long. E. o	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established
HARWICH Two fixed lts.; in one N.W. by N.	51 56.6 1 7.4	A lower red lt. in high tower vis. S. of entrance, becomes white in fairway (see Directions).	●	69 25	13 10	1818
DOVERCOURT Two lighthouses	.....	Building on the extreme point, to supersede present Harwich lts.	..	..	..	1861
Landguard Fort	.....	A red light outside, white within the entrance	6a	..	..	1848
CORK LIGHT-VESSEL One br. rev. lt. $\frac{1}{2}$ min.	51 56. 1 23.	In 4 fathoms, near the Cork Ledge	●	38	10	1840
SHIPWASH LT.-VESSEL One bright fixed light	52 1.5 1 38.	In 9½ fathoms, off N.E. end of the Sand	●	38	10	1837
ORFORDNESS Two bright fixed lights	52 5.6 1 35.2	Towers red; in one S.W. by W. and N.E. by E., 1439 yards apart. High light to South...	1a ●	83 63	14 13	1792
Pakefield	... : ..	Red light; only shows to S. $\frac{1}{4}$ E.	●	68	9	1832
LOWESTOFT Two bright fixed lights	52 29.2 1 45.5	Towers white; in one N. $\frac{1}{2}$ E. and S. $\frac{1}{2}$ W., 1013 yards apart. High light to North	● ●	119 45	16 11	1609
STANFORD LIGHT-VESSEL Two bright fixed lights	52 29. 1 47.2	Near Mid channel in 6 fathoms; lights horizontal; two red balls	●	23	9	1802
ST. NICHOLAS GAT LT.-V. One bright, one red lt.	52 35.5 1 47.	In 6 fms. at N. end of Kettle Bottom Sd.; one red ball; lts. at unequal heights	a ●	40 12	10 4	1827
Yarmouth or Gorleston One red fixed light	52 34.4 1 44.3	A red flag by day, and the light shown during the flood tide ..	●	..	2	1852
COCKLE LIGHT VESSEL One brt. rev. lt. 1 min.	52 41.5 1 47.	In 6½ fathoms at E. side of N. entrance of Cockle Gat	●	36	10	1844
WINTERTON NESS One bright fixed light	52 43. 1 41.5	An octangular red tower 61 feet high	●	52	14	1790
NEWARD LIGHT-VESSEL Three br. fixed lights	52 45. 1 53.	Lts. triangular. In 19 fms. at N. end of Sand. Three red balls	●	38 28	10 10	1791
HASBOROUGH Two bright fixed lights	52 49. 1 32.	In one N.W. $\frac{1}{2}$ W. ($\frac{1}{2}$ mile apart) leading lts. for Hasboro' Gat	●	137 100	17 15	1791
HASBOROUGH LT.-VESSEL Two bright fixed lights	52 58. 1 36.	In 15 fathoms near N. end of Sand; lights horizontal	●	38	10	1832
LEMAN & OWER LT.-VES. Upper revol. 1 min., low fixed light	53 8.6 2 1.	In 16 fms. between the Sands; lts. at unequal heights; two red balls	●	38 27	10 10	1840
CROMER One br. revol. 1 min.	52 55.4 1 19.1	Near the Cliff, a white tower 59 feet high	●	274	23	1719 1833
HUNSTANTON One bright fixed light	52 56.9 0 29.8	The light is red to S.E. by E. $\frac{1}{2}$ E. over the Roaring Middle Sand	2a	109	16	1665

Name and Character of Light.	Lat. N. Long. E. ○ /	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
LYNN WELL LT.-VESSEL One quick revol. light	53 1.7 ○ 25.	In 27 fathoms off the hook of the Long Sand	●	34	10	1828
DUDGEON LIGHT-VES. One bright fixed light	52 15. ○ 56.	In 9 fathoms near S. side of the Shoal	●	38	10	1736
SPURN LIGHT-VESSEL One br. rev. lt. $\frac{1}{2}$ min.	53 34. ○ 13.	In 9 fathoms off the Point.....	●	38	10	1820
SPURN POINT Two bright fixed lights	53 34.7 ○ 7.2	In one N.W. $\frac{1}{2}$ N. (158 yards apart). The low light to N.W.	1a 4a	93 54	15 12	1776 1861
RIVER HUMBER						
Bull Sand Lt.-Vessel	.....	One bright fixed lt. off Spurn Pt.	●	21	10	1832
	W. Lon.					
Stallingborough Ferry	.....	One bright fixed lt. to W.S.W.	●	..	..	1849
Killingholme Three br. fixed lts.	53 39. ○ 12.	Lights in one N.W. lead up the river, and when S. by W. lead down	●	68 36	11	1836 1852
Paull.	.....	One bright fixed light	●	36	7	1836
Hebbles Light Vessel One red fixed light	53 44. ○ 16.	In 5 fms. on S. side of Channel, near Hull	●	16	5	1839
Bridlington One bright fixed light	54 5.2 ○ 11.7	On the North Pier-head while 9 feet water.....	..	24	8	1852
FLAMBORO' HEAD One revol. light, 2 min. bright, bright and red alternately	54 6.9 ○ 4.8	A white tower 87 feet high. Bearing N.N.E. clears N. end of Smithie.....	●	214	20	1806
Scarborough Tide Light One fixed light, red to seaward	54 17. ○ 23.	While 10 feet water; on Vincent Pier. A ball by day .....	..	58	13	1806
HIGH WHITBY Two bright fixed lights	54 28.7 ○ 34.2	In one S. by E. $\frac{1}{2}$ E. (258 yards apart). A red light from N. tower over the Scar	1a ea.	240	23	1858
WHITBY HARBOUR One green tide light One red or green light	54 30. ○ 37.	Green tide light on W. Pier from 2 hours flood to 2 hours ebb. E. Pier light red to S. but green to N. of Rock buoy	● ●	83 54	13 10	1831 1855
TEES BAY						
BRAN SAND High br., low red lt.	54 38. I 13.	Wooden towers shifted occasionally. In one lead over the bar	●	53 38	11 10	1839
Care Sand Lt.-Vess.	.....	One fixed light. There are 8 small lights up the Tees	●	20	7	1836
SEATON High br., low red lt.	54 40. I 12.	In one N.W. by W. (118 yards apart).	●	89 34	13	1839
HARTLEPOOL High bright, low red tide light	54 41.8 I 10.4	On the Heugh. The red tide lt. from half flood to half ebb....	1a 4a	84 62	15 4	1847

Miles. Year established.	Name and Character of Light.	Lat. N. Long. E. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
0 | 1828	Hartlepool Old Harbour	.....	<i>Red light on Pier, two red lights on Quay</i>	1	..	..	1836
0 | 1736	— West Harbour	.....	<i>Green lt. on N. Pier, two red lts. in one lead in while 10 ft. water</i> .....	..	..	..	1855
10 | 1820	SEAHAM Upper bright fixed lt., low red rev. lt. $\frac{1}{2}$ min.	.....	<i>In one stone tower 58 feet high on Red Acre Point</i>	5a 6	94 49	14 11	1843 1857
15 | 1776	Seaham Harbour	.....	<i>Red tide light, when practicable</i> .....	●	..	..	1846
12 | 1851	SUNDERLAND One bright, one red lt. on N. Pier, one bright tide light on S. Pier	54 55.1 1 21.6	<i>Tide light from $\frac{1}{2}$ flood to $\frac{1}{2}$ ebb, a green light below it shows danger</i>	3a 5a	73 58	14 4	1802 1857
10 | 1832	TYNEMOUTH One br. rev. lt. 1 min.	55 1.1 1 24.9	<i>A square white tower 79 ft. high, near Priory Ruins in the Castle</i>	●	154	18	1802
.. | 1849	Tyne Tide Lights	55 0. 1 26.	<i>At N. Shields, from $\frac{1}{2}$ flood to $\frac{1}{2}$ ebb; in one W. by N., 240 yards apart</i>	●	123 77	16 13	1808
11 | 1836 1852	Blyth, two bright Tide Lts.	.....	<i>While 8 ft. water; in one N. by W. $\frac{1}{2}$ W.</i>	●	11	48	1783
7 | 1836	COQUET ISLAND One bright fixed light	55 22. 1 32.	<i>A red ray toward Hanxley Pt. buoy, and red over the Boulmer Rocks</i>	1a	83	14	1841
5 | 1839	Warkworth red Tide Lt.	.....	<i>While 10 ft. water. On S. Pier</i> .....	..	..	1	1848
8 | 1852	FARN ISLAND Upper light rev. $\frac{1}{2}$ min., lower fixed	55 36.9 1 58.9	<i>Two white towers in one N. by W. $\frac{1}{2}$ W., 187 yards apart</i> ..	●	87 45	15 12	1776
20 | 1806	LONGSTONE One br. rev. lt. $\frac{1}{2}$ min.	55 39. 1 37.	<i>Red tower on the Rock</i>	●	75	14	1826
13 | 1806	BERWICK ON TWEED Upper br., lower red lt.	55 45.9 1 58.9	<i>Low red lt. while 10 feet on Bar. On the Pier-head</i>	●	44 28	11 8	..
23 | 1858							

11 | 1839

7 | 1836

13 | 1000

15 | 1847

Name and Character of Light.	Lat. N. Long. W. •	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
Eyemouth	.....	One <i>red</i> fixed light .....	..	.. | .. | ..	1857	
ST. ABB'S HEAD One bright fixed light	55 55. 2 8.	Building (1860)	1a	.. | .. | ..	1860	
DUNBAR Old Harbour Victoria Harbour	56 0. 2 30.7	One fixed br. light at each, from July to October .....	..	.. | .. | ..	1857	
INCHKEITH One br. rev. lt. 1 min.	56 2. 3 8.	A white tower, 45 feet high	2b	220 | 18	1804	
FISHERROW One fixed light	.....	On the pier head; all night, ex- cept in moonlight	●	20 | 5	1839	
Leith Red light on E. pier White light on W. pier	55 59. 3 10.	A green lt. under the white one on W. pier while 8 ft.; the green changed to red when Dock gates are open	5a	28 | 10	1829	
Newhaven	.....	One bright light on the pier....	..	20 | 5		
GRANTON	.....	One red light on pier head ....	..	33 | 6	1845	
GRANGEMOUTH One fixed light	.....	At the entrance of the River Carron	●	33 | 10	1847	
INVERKEITHING	.....	Two red lights on W. Quay ....	..	.. | ..	1856	
Burntisland East Pier Ferry Pier A fixed light on each	56 4. 3 14.	Also a small red lt. at Newhall, and a white one at Queensferry, for passage boats only .....	..	13 | 8 28 | ..	1845 1853	
KIRKCALDY One fixed light	56 7. 3 9.	On E. pier head. Red to seaward; white when Harbour is open..	..	29 | 8		
Buckhaven	.....	A white light on E. pier head ..	a	17 | 9	1854	
St. MONAN One red, and one br. lt.	56 12.5 3 46.3	One on pier head; the other on a house .....	..	20 | ..	1855	
PITTENWEEN Three fixed red lights	56 13. 2 43.5	Two on pier head, and one on a building. Not lighted between May 15 and July 15. In bad weather a br. gas lt., 50 feet high, vis. 7 miles, is shown while 6 feet .....	..	25 | 6 72 | 6	1853	
ANSTRUTHER One red and one green lt.	56 13.3 2 41.8	N.E. $\frac{1}{2}$ N. and S.W. $\frac{1}{2}$ S. from each other. Aug. to April ..	..	20 | 4	1848	
CELLARDYKE One fixed red light	.....	On a house, in W. of Harbour; only while boats are out ....	.....		
ISLE OF MAY Two brilliant fixed lts.	56 11.1 2 33.3	On the summit of the island, N.E. side; N.N.E. $\frac{1}{2}$ E., and S.S.W. $\frac{1}{2}$ W., 750 feet apart	1a ●	240 | 21 110 | 15	1816 1844	
BELL ROCK One rev. light, bright and red alternately, every 2 minutes	56 26.1 2 23.1	A tower, 117 feet high; on the Bell Rock, at 10 feet below high water. A bell is sounded every half minute in fogs	●	90 | 14	1811	
ST. ANDREW'S Two fixed lights	56 20. 2 47.	On the pier head, and a turret in Cathedral wall	● 5a	30 | 6 100 | 5	1825 1849	

Name and Character of Light.	Lat. N. Long. W. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year erected
BUDDONNESS or TAY Two brilliant fixed lts.	56 28.1 2 44.9	The lts. in one, N.N.W. $\frac{1}{2}$ W., and S.S.E. $\frac{1}{2}$ E., 374 yards apart, lead into the Tay	● ●	71 | 45	10 | 8	1820
PORT ON CRAIG Two fixed lights	56 27. 2 49.	Leading lts. up the Tay. W.N.W. Northly, and S.S.E. Southly, 1,700 yards apart. A bell in fog	● ●	80 | 35	16 | 11	1820 | 1845
NEWPORT Two fixed lights	56 26. 2 57.	On the W. Ferry pier, N.N.E. and S.S.W., 63 yards apart ..	●	10 | 16	7 | 8	....
DUNDEE HARBOUR Two fixed red lights	.....	On Mid. and E. piers, N.W. $\frac{1}{2}$ W., and S.E. $\frac{1}{2}$ E., 130 yards apart ..	●	10 | 12	7 |	1827
ARBROATH One red fixed light	56 33. 2 35.	On the N. pier, when vessels enter. An occasional bright flash is a warning to keep off.	●	24	8	1826
MONTROSE Two fixed red lights	56 42. 2 27.	On the N. side of entrance, N.W. by W. $\frac{1}{2}$ W., and S.E. by E. $\frac{1}{2}$ E., 303 yds. apart	●	60 | 35	10 | 11	1818
STONEHAVEN One br., one red fixed lt.	56 58. 2 12.	W. by N. $\frac{1}{2}$ N., and E. by S. $\frac{1}{2}$ S.; on the inner side of Harbour	●	18 | 24	6 |	1839
GIRDLENESSE Two bright fixed lights	57 8.2 2 3.	In one tower	1a	185	19	1833
<i>Aberdeen</i> One bright fixed light Two red (or green) fixed lights	57 8.5 2 4.1	On N. pier head, from half flood to high water. When entrance is safe the two lts. are red: when ships cannot enter, green .....	..	40 | 47 | 30	8 | 3	1842
BUCHANNESS One flashing lt., 5 secs.	57 28.2 1 46.1	A stone tower, on the Ness	●	130	16	1827
PETERHEAD One br., and one red lt.	57 30. 1 46.	White on elbow of W. Pier in S. Harbour; and red, on W. Pier, in N. Harbour	a	24 | 26	10 | 10	1834 | 1849
FRASERBURGH Two fixed red lights	57 41.5 2 0.	On pier head, and Middle Pier; S.E. by E., and N.W. by W., 228 ft. apart, from July to April .....	..	36	5	1841
KINNAIRD HEAD One bright fixed light	57 42. 2 1.	A stone tower, 76 feet high, on the Head	1a	120	15	1851
MACDUFF One red fixed light	57 40. 2 30.	On the W. pier head	●	25	6	1829
BANFF Two white, one red, lts.	57 40. 2 31.	One white light on N. pier head, and one high white lt., with lower red lt. in the upper part of the New Harbour .....	..	28	8	1851
<i>Elgin and Lossiemouth</i>	.....	One green light on S. pier head .....	..	30	..	1858
COVESEA SKERRIES One rev. lt. 1 min.	57 43.2 3 20.3	On Craig Head. It is red from S. E. by E. $\frac{1}{2}$ E., to S.E. $\frac{1}{2}$ S. The rest is bright	1b	160	18	1846

Name and Character of Light.	Lat. N. Long. W. ° °	Description, &c.	Description of Apparatus	Height above H.W.	Visible in Miles.	Year established.
CHANONRY POINT A bright fixed light	57 34.5 4 5.	A tower, 42 feet high, on the Point.....	4a	40	11	1846
CROMARTY POINT One red fixed light	57 41. 4 2.	A tower, 42 feet high, on the Point.....	4a	50	9	1846
TARBET NESS One interm. lt., 3 min.	57 51. 3 48.	Bright 2½ min., eclipsed ¼ min.; within Moray Frith it is visible always	●	175	18	1830
Little Ferry Two fixed white lights	57 56. 4 0.	Two Lanterns; one on Point; N.W. ½ N., and S.E. ½ S., 150 feet apart .....	..	19	4	...
Latheronwheel One fixed white light	58 16.1 3 22.9	On S. Head, at the end of fishing season .....	..	14	3	...
WICK or PULTENEY TOWN One red light	58 26. 3 5.	On the N. pier head, during July and August	a	35	8	1851
NOSS HEAD One rev. lt. half min.	58 28.6 3 3.1	From N.E. ¼ N. to W.N.W. the lt. is red; the rest, to seaward, is bright	1b	175	20	1849
DUNNET HEAD One bright fixed light	58 40.3 3 22.3	A stone tower on the northernmost point of Scotland	1a	346	23	1831
PENTLAND SKER. Two bright fixed lights	58 41.4 2 55.4	Two stone towers, 118 and 88 ft. high, N.N.E. and S.S.W., 100 feet apart	1a	170	18	1794
HOLBURN One fixed light	58 37.5 3 31.8	Building on the Head .....	..	...	...	1860

Orkney Islands.

CANTICK One br. rev. lt., 1 min.	.....	A white tower, 73 ft. high, on the Head, Hoy Id.	2b	116	16	1858
HOY SOUND High lt., red or white Low light, bright	58 56.1 3 16.5	The low lt. (br.) is on N.W. Pt. The high lt. is red toward Hoy Sound; white between S.S.E. and W.S.W. The towers stand S.E. ½ E., and N.W. ½ W., 2,237 yards apart	● a	115 65	10 7	1851
KIRKWALL One bright fixed light	58 59.2 2 57.5	On the pier head, from August to April	●	20	9	1854
START POINT One fixed bright light	59 16.6 2 22.4	A stone tower, on E. Point of Sanda Island.....	4a	100	15	1806
N. RONALDSHA One br. flash.lt. 10 secs.	59 23.2 2 23.6	A brick tower, 139 feet high, on N. Point	a	140	18	1854

Shetland Islands.

SUMBURGH HEAD One bright fixed light	59 51. 1 16.	A stone tower, 55 feet high, on the S. Point of Zetland	●	300	22	1812
BRESSAY One rev. red and white lt., 1 min.	60 6.1 1 7.5	Tower, 53 feet high, on E. side of entrance to Lerwick	2b	105	15	1858

	Name and Character of Light.	Lat. N. Long. W. ○ /	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
1846	WHALSEY SKER. One br. rev. lt., 1 min.	60 25.4 ○ 44.	A white tower, 98 feet high, on Bound Skerry	1b	145	18	1854
1846	NORTH UNST One bright or red lt.	60 51.3 ○ 53.	Red between S.S.E. $\frac{1}{2}$ E., and S.E. by E. $\frac{1}{2}$ E. A white tower on N. part of Island	1a	235	21	1854
1830	CAPE WRATH One revol. lt., 2 min.	58 37.5 5 ○	White and red alternately	●	400	23	1828
....	S. RONA One flash lt., 12 secs.	57 32. 5 58.	N.E. Point of Island	2c	222	20	1857
1852	KYLE AKIN, LOCH ALSH One bright fixed light	57 16.5 5 45.	S.W. Point of Gillean Island ...	..	53	11	1857
1851	ORONSAY ISLAND One bright fixed light	57 9. 5 47.	S.E. part of Sleat Sound .....	..	58	12	1857
1849	Hebrides Islands.						
1831	BUTT OF LEWIS	58 31. 6 16.	Building on N. Point .....	..	..	..	1860
1794	STORNOWAY One fixed, 1 rev. light	58 11.5 6 22.1	200 yards apart; rev. every $\frac{1}{2}$ min., on Arnish Point .....	..	27	2	....
1860	MONACH OR HYSKERE	57 31.6 7 41.6	Building on W. Island	1a	..	..	1860
1855	GLASS ISLAND One fixed bright light	57 52. 6 33.	N.E. Point of Island, Harris Isles	1a	130	17	1789
1851	USTRENISH One bright or red lt.	57 15. 7 10.	E. side of S. Uist. Red vis. between S.S.W. and N.E. by the S. & E.	1a	176	18	1857
1851	BARRA HEAD One intermitting light	56 48. 7 38.	Vis. $2\frac{1}{2}$ min. and dark $\frac{1}{2}$ min. On top of Bernera Island	●	680	33	1833
1854	SKERRYVORE One rev. light, 1 min.	56 19.3 7 6.5	On the Rock	1c	150	18	1844
1806	ARDNAMURCHAN One fixed bright light	56 43.6 6 13.5	On the Point	1a	180	18	1849
1854	SOUND OF MULL One fixed light	56 38. 6 4.	Red lt. N. to Sea; green, towards Rocks; white, towards Mull Sd.	..	55	12	1857
1812	LISMORE One fixed bright light	56 27.3 5 36.3	On Musdile Island	●	103	15	1833
1858	LOCH EIL One fixed bright light	.....	On Corran Point. Lt. is red be- tween N.E. by E., and S.W. by W. $\frac{1}{2}$ W. .....	..	36	10	1860
1858	Oban	.....	A Lantern on the Pier .....	..	..	..	1858
1858	PIHLADDA ISLAND	56 19.0 5 39.5	One fixed br. lt., shows red from N. | .. | 42 | 11 | 1860	..	..	..	..
	Crinan Canal	.....	One red light on E. side .....	..	25	4	1851

Name and Character of Light.	Lat. N. Long. W. o /	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
IRON ROCK OR SGEIR MAOILE	55 52.5 5 50.	Proposed, on the Rock .....	...	...	...	1860
ISLAY, SD.	RHU VAL One fixed red or white light	55 56.1 6 7.5	N. Point of Islay Island	2a | 147 | 15 | 1859		
	M'ARTHUR'S HEAD	55 45.8 6 2.8	Building .....	... | ... | ... | 1860		
RHYNN'S OF ISLAY	55 40.3 6 30.	Oversay Island, off S. W. Point of Islay.....	● | 150 | 17 | 1825			
Port Ellen	55 36.	On Carraig Fadda Point, W. entrance .....	... | 45 | 11 | 1853			
MULL OF CANTYRE	55 19. 5 49.	S.W. Headland of Cantyre ....	● | 297 | 22 | 1787			
SANDA ISLAND	55 16.5 5 34.9	On the Ship Rock	1a | 165 | 15 | 1850			
DAVAR ISLAND	55 25.7 5 32.2	Stone tower, 65 feet high, on E. part	2b | 120 | 17 | 1854			
Campbellton	.....	On Old pier head. Red, when bearing N.W. ....	... | 18 | 2 | ....			
Ardrishaig	.....	A fixed white light on Pier head .....	... | 25 | 4 | 1850			
PLADDA	55 26.0 5 7.1	One 52 ft. above the other. On Id. off S.E. Pt. of Arran Id...	.. | 130 | 17 | 1790	● | 77 | 14 |		
CLYDE RIVER						
CUMBRAE	55 43.3 4 58.	W. side of Little Cumbrae Id...	● | 115 | 15 | 1793			
One fixed bright lt.						
TOWARD	55 51.7 4 59.2	On the Point .....	● | 55 | 11 | 1812			
One br. rev. lt., 1 m.						
CLOCH	55 56.6 4 52.6	On the Point .....	● | 76 | .. | 1797			
One fixed bright lt.						
GREENOCK	55 57. 4 45.	The red lts., 1 mile N.N.W. of Custom House, 140 yds. apart, W.S.W. $\frac{1}{4}$ W., and E.N.E. $\frac{1}{4}$ E. The white light in front of Custom House.....	.. | 40 | .. | 1834	.. | 26 | 4 | 1829		
Two red, and 1 white light						
Port Glasgow	.....	One fixed red light on W. Quay	... | 18 | 3 | ....			
CARDROSS	.....	On the Pillar Bank .....	... | 22 | 4 | 1849			
One fixed red light						
Bowling Bay	.....	Small lt. at Firth of Clyde Canal	... | 12 | 2 | 1849			
Donald's Quay	.....	A red light, 200 feet from end ..	... | 26 | .. | 1849			
Broomielaw	.....	A Budo light .....	... | ... | ... | 1844			
Auchenleach	.....	A whitel., $\frac{1}{4}$ m. above Pt. Glasgow	... | ... | ... | ....		
Garmoyle Light	.....	A floating lt., 3 miles above Pt. Glasgow .....	... | ... | ... | ....		
Dickies Light	.....	A white lt., 1 mile above Dunbarton .....	... | ... | ... | ....		

Year established.	Name and Character of Light.	Lat. N. Long. W. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
1860	Ardrossan	55 38.4 4 49.5	One red light on Breakwater ..	a	25	5	1866
1859	Saltcoats	55 37.9 4 47.4	Bright bull's eye in red glass plate, on Pier .....	..	26	6	1840
1860	TROON HARBOUR One br. revol. and 1 fixed red light	55 33. 4 41.	Revolves 40 secs. bright, 20 secs. hidden. N.E. & N., and S.W. & S., 350 yards apart .....	..	35	9	1827
1825	AYR HARBOUR Two white, 1 red tide, fixed lights	55 28.3 4 38.4	A red and br. lt. in one building. S.E. by E. & E., and N.W. by W. & W., 283 yards apart. Red light while 8 feet on Bar	..	12	4	1790
1853	LOCH RYAN One fixed bright light	54 57.7 5 2.0	On Cairn Ryan Point	4a	46	10	1847
1787	CORSEWALL One red and white rev. 2 min.	55 0.5 5 9.5	A white tower, 110 ft. high, on W. side of entrance to Loch Ryan	●	112	15	1817
1854	Port Patrick One fixed bright light	54 50.3 5 7.0	S.E. angle of Harbour .....	..	37	8	1856
1850	MOUTH of GALLOWAY Intermitting br. lt.	54 38.1 4 51.3	On S. Point. Visible, 2½ min.; invisible, ¼ min.	●	325	23	1830
1790	LITTLE ROSS One flash. light, 5 secs.	54 46. 4 5.	On the Island	1c	175	18	1843
1793	SOUTHERNESS One fixed bright light	54 52.4 3 35.5	On the Point .....	..	50	11	1805
1812	Annan River One fixed white light	54 57.7 3 16.	On Annan Foot, from half flood to half ebb	1841
1797							
1834							
1829							
....							
1849							
1849							
....							
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....							

Name and Character of Light.	Lat. N. Long. W. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
FASTNET One rev. light, 2 min.	51 23.3 9 86.4	On the summit of the Rock	1b	148	18	1854
KINSALE One bright or red light, and one bright light	51 41.8 8 15.2	The Lt. on S. Point of Old Head is red over the Horse Rock, and br. to seaward. Br. Lt. on Ft. Charles, E. side of Harbour ..	1a ●	236 98	21 14	1853 1804
CORK HARBOUR or QUEENSTOWN						
ROCHE POINT One red or br. Lt.	51 47.6 8 15.2	Red to Seaward; br. towards the Harbour. (Revolv. in 1861?).	●	92	4	1817
SPIT BANK One red light	51 50.7 8 16.4	Off Queenstown, on piles, in 9 ft. water, on E. elbow of Bank ..	4a	32	8	1853
MEELOUGH SPIT One red light	.....	On piles, 100 ft. from the Channel	a	25	3	....
BALLYCOTTIN Flashing light, 10 secs.	51 49.5 7 59.	On the Outer Island	1c	195	18	1850
YOUUGHAL One bright light	51 56.5 7 50.5	On W. side of entrance	3a	78	6	1852
MINEHEAD Interm. light, 1 min.	51 59.5 7 35.1	On S. side of Head. Br. 50 secs.; suddenly dark, 10 secs.	1a	285	21	1850
DUNGARVAN Red, green, and br. Lt.	52 4.4 7 33.1	On Ballinacourty Pt. Red over Carrickapane Rock; green, over Rocks from Ballinacourty Pt.; and bright in other directions	3a	52	10	1853
WATERFORD HOOK TOWER One bright light	52 7.4 6 55.9	E. side of entrance. Fog bells	●	152	16	1859
DUNMORE PIER HEAD One red light	52 9. 6 59.5	W. side of entrance. It is bright N. of Pier .....	...	...	...	....
DUNCANNON FORT Two fixed lights	52 13.2 6 56.	In one tower. The lower is a tide light	●	53	10	1803
DUNCANNON N. One fixed light	.....	Half mile N.N.E. $\frac{3}{4}$ E. of the Fort	●	128	16	1838
SALTEES LT. VESS. Two fixed bright lights	52 2.4 6 38.2	In 32 fathoms, off Coningbeg Rock	●	38 28	10	1824
TUSKAR Red and br. rev. light	52 12.1 6 12.3	A flash of 10 secs. every 2 min.; bright, br. and red alternately	●	101	15	1815
East Coast.						
BLACKWATERBANK LT. VESS. One fixed light	52 29.5 6 7.	In 19 fathoms, on N.E. part of Bank	●	33	9	1860
ARKLOW LT. VESS. One br. rev. lt., 1 min.	52 42. 6 0.	In 22 fathoms, on S. end of Bank	●	39	10	1860
WICKLOW Two fixed br. lights	52 57.8 6 0.1	In one, N.W. by W. $\frac{3}{4}$ W., 180 yards apart	●	250 121	21 16	1860 1818

Year established.	Name and Character of Light.	Lat. N. Long. W. o °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
3 | 1854	DUBLIN BAY KISH LT. VESS. Three bright lights	53 19. 5 56.3	In 10 fms., off N. of Kish Bank. The lts. are set triangularly ..	● | 38 | 10 | 1811	20		
1 | 1853	KINGSTOWN E. Pier One rev. lt., $\frac{1}{2}$ min.	53 18. 6 9.	White and red light alternately. A fog bell.....	● | 41 | 9 | 1822			
4 | 1804	KINGSTOWN W. Pier One fixed red light	.....	.....	● | 36 | 2 | 1845			
4 | 1817	POOLBEG Two bright lights	53 20.5 6 9.3	At Mouth of R. Liffy. Lower lt. from half flood to half ebb ..	● | 68 | 12 | 1768			
8 | 1853	BAILEY One bright light	53 21.7 6 3.3	On S.E. point of Howth Penins. A fog bell.....	● | 134 | 15 | 1813			
3 | ....	HOWTH E. Pier One red light	53 24. 6 4.	On Pier Head .....	● | 43 | 11 | 1818			
18 | 1850	BALBRIGGAN One bright light	53 36.8 6 11.	On Pier, S. of entrance .....	● | 42 | 10 | 1769			
6 | 1852	ROCKABILL One br. and red flash. It.	53 35.7 6 0.5	Flash every 12 secs.; bright sea- ward, red to Westward	1b | 148 | 18 | 1860			
21 | 1850	DROGHEDA Three fixed br. lights	52 43. 6 15.	On Sandhills, S. of R. Boyne. Changeable, as sandbanks shift	● | ... | 6 | 1842			
10 | 1858	DUNDALK One flash. It., 15 secs.	53 58.7 6 18.	Red towards W. side of Dundalk Bay. White to seaward	4b | 33 | 9 | 1855			
16 | 1859	CARLINGFORD HAULBOWLINE ROCK Two bright lights	54 1. 6 5.	In same tower. Lower lt. from half flood to half ebb. Fog bell .....	● | 101 | 15 | 1823			
.. | ....	GREENORE POINT	.....	One revolving light., 45 secs.	● | 29 | 9 | 1830			
10 | 1803	DUNDRUM BAY One inermitt. red light	54 13.1 5 40.	On St. John's Pt. Red 45 secs., dark 15 secs.	1b | 62 | 12 | 1844 1860			
16 | 1838	Ardglass Harbour	.....	One fixed red light .....	● | 18 | 6 | 1851			
10 | 1824	SOUTH ROCK One rev. br. lt., $1\frac{1}{2}$ m.	54 23.9 5 25.1	A white tower, 60 fset high, on the Rock .....	● | 52 | 12 | 1797			
15 | 1815	DONAGHADEE Pier Head One red or br. fixed lt.	54 38.6 5 32.	Red to seaward; bright towards Harbour and Belfast Bay ....	● | 56 | 12 | 1826			
9 | 1860	COPELAND D One fixed bright light	54 41.7 5 32.	A white tower, 52 feet high, on Small Copeland Island .....	● | 131 | 16 | 1796			
10 | 1860	BELFAST BAY One red lt., and others	54 39. 5 53.	Red lt. on Hollywood Bank; green lt. also on the Bank; 3 more green lts. towards Belfast; and a red lt. S.W. of Stone Beacon	5a | 27 | 5 | 1848			
21 | 1860 16 | 1818	Larne Lough	.....	One bright light on Farres Point	● | 42 | 11 | 1839			
MAIDENS	MAIDENS Two fixed bright lts.	54 55.8 5 45.	Towers white, with red belt In one, N.W. by W., 640 yds. apart	● | 94 | 14 | 1828 84 | 13 |			
RATHLIN	RATHLIN One intermit., 1 fixed lt.	55 18.2 6 10.7	Upper lt. intermit., br. 50 secs.; dark 10 secs. Lower lt. fixed. Red lt. over Carrickvanan Rock	1b | 243 | 21 | 1853 1b | 182 |			

Name and Character of Light.	Lat. N. o °	Long. W. °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
LOUGH FOYLE INISHOWEN Two fixed bright lts.	53 13.6 6 55.6		On Dunagree Point. In one, E. and W., 152 yards apart	●	67	13	1837
Red Castle One fixed bright	.....		On piles, on outer edge of Ridge Shoal.....	..	25	..	1852
White Castle One fixed bright lt.	.....		On piles, E. side of Channel....	..	26	..	1848
Ture One fixed bright lt.	.....		On piles, S.E. side of Channel ..	..	25	..	1850
Cunnyberry One fixed bright lt.	.....		On piles, N.W. side of Channel ..	..	25	..	1848
Culmore Point	.....		A Lantern on a Mast.....	..	45	..	1848
Culkeeragh	.....		Bright light E. side of entrance ..	..	50	..	1851
Boom Hall	.....		One fixed red light .....	..	12	..	1859
Ross Bay Lt. Vessel	.....		One fixed bright light .....	..	20	..	1859
Rock Mill	.....		One fixed red lt., near the Mill ..	..	15	..	1859
INNISTRAHUL One br. rev. lt., 2½ min.	55 25.9 7 13.6		A white tower, 41 feet high. On N.E. part of Island ..	●	181	18	1812
LOUGH SWILLY One red or bright light	56 16.6 7 37.9		On Fannet Point; red seaward, bright towards the Lough....	●	90	14	1816
TORY ISLAND One fixed bright light	55 16.4 8 15.		On the N.W. Point of Island ..	1a	125	16	1832
ARANMORE ISLAND One flashing br. light	55 0.9 8 33.6		Building (1861) on N.W. Point ..	2b	..	..	....
RATHLIN-O-BIRNE One flash. lt., 20 secs.	54 39.8 8 49.9		Red towards Mainland and Sound. To be a fixed light after Aranmore is lighted	2b	116	16	1856
KILLYBEGS St. John's Point	54 34.1 8 27.6		One fixed bright light	●	98	14	1831
Rotten Island	.....		One fixed bright light	●	66	12	1838
SLIGO Black Rock	54 18. 8 37.		One fixed bright light in the Bay ..	●	79	13	1835
Oyster Island	.....		Two fixed br. lts., in 1 S.S.E. ¼ E. ..	●	40	11	1837
BROADHAVEN One br. or red fixed lt.	54 16. 9 53.		On Gubacashel Pt. White to seaward; red towards W. side of Harbour	3a	87	12	1855
EAGLE ROCK Two bright fixed lights	54 17. 10 6.		3 miles from Erris Hd. In one E. by N., and W. by S., 132 yards apart	●	220	20	....
BLACK ROCK One light intended	54 4. 10 19.		Building (1861) .....	..	..	..	....

Name and Character of Light.	Lat. N. Long. W. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
CLEW BAY CLARE ISLAND	53 49.5 9 59.	One fixed bright light on N. Point	●	341	27	1806
INISHGORT ISLAND	53 49.6 9 40.2	One fixed bright light	●	36	10	1827
SLYNE HEAD One rev. red and bright light, 2 min., and 1 fixed bright light	53 23.9 10 14.	N. light rev., with one red and two br. faces; the rev. and fixed its. in one N. $\frac{1}{4}$ E. and S. $\frac{3}{4}$ W., 142 yards apart	●	126 115	16 14	1836
GALWAY BAY EERAGH ISLAND One rev. bright light	53 6.9 9 51.5	O. W. Point. Bright flash every 3 min.	1b	115	16	1857
INISHEIR One bright or red lt.	53 2.7 9 31.5	Red in direction of Finnis Rock	1a	110	15	....
Mutton Island One fixed bright lt.	53 15.2 9 3.1	On centre of Island, off Galway	..	33	10	1817
SHANNON, RIVER LOOPHEAD One fixed bright lt.	52 13.6 9 55.9	500 yards from extremity of Head	1a	277	22	1853
KILCRADAN One bright or red lt.	52 2. 9 .	On the Point. Red to seaward; bright to River	●	133	16	1824
Tarbut One bright fixed lt.	52 35.5 9 21.8	On the Rock	●	58	13	1834
Beeves One bright or red lt.	52 39. 9 1.3	Red to N. of Rock	3a	40	10	1854
TRALEE One bright or red light	52 16.3 9 53.2	On Little Samphire Id. Red lt. seaward fr. W.N.W. to N. $\frac{1}{4}$ E.	4a	56	9	1850
VALENTIA One fixed bright light	51 56. 10 19.3	On Cromwell's Fort	●	54	12	1841
SKELLIGS Two fixed bright lights	51 46.2 10 32.7	On highest Rock, 7½ miles from shore. One lt. will be discontinued when Calf R. is lighted	●	372 175	25 18	1826
CALF ROCK One light	51 34.2 10 15.	Building (1861). .....	..	..	..	....
BANTRY BAY One fixed bright light	51 39.2 9 44.8	E. entrance to Bearhaven	●	55	12	1847
CROOKHAVEN One bright or red light	51 28.6 9 42.6	On Rock Island Pt. Red across Rocks to Shuk Head	●	67	13	1860
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Name and Character of Light.	Lat. N. Long. E. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
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WHITE SEA.

JIJGINSK	65 12.2	On the N. height of Island	140	17	1842
One fixed bright light	36 51.					
MOUDIUGA	64 55.5	On a sandy Hillock on the Id., at entrance of R. Dvina ....	..	140	16	....
One fixed bright light	40 16.					
MORJOVETS	66 45.7	640 yards in shore of N.W. Point	..	150	14	1842
One fixed bright light	42 30.	of Island				
ORLOV	67 11.2	N.E. Point of C. Orlov, 1,200	..	222	17	1842
One fixed bright light	41 20.5	yards from Beach				

NORWAY.**West Coast.**

Hekkingen, Malang Fiord	69 36. 17 50.5	N. side of Hekking Id. From Aug. 15 to May 1	4a	66	14	1859
ANDENTS	69 19.5 16 9.	From Aug. 15 to May 1. Flash every 3 min.	2d	143	20	1859
Klopen, or Gloppeen	67 53.5 13 4.5	Sörvaagen, S. of entrance. From Sept. 1 to April 14	6a	134	11	1857

LOFOTEN ISLANDS

Svinö	68 3.	Near Balstad. September 1 to	●	196	11	1857
One fixed red light	13 34.5	April 14				
HENNINGSVÆR	68 8.5	Quitverden. Flash every 3 min.	●	113	16	1857
One fixed & flash. lt.	14 14.5	August 15 to May 1				
Kjøen, or Kie I., S. Point	68 13.2	Svolvær. September 1 to April	●	54	4	1856
One fixed bright light	14 37.	14				
Sjaaholmen	68 9.5	Skraaven's Harbour. Sept. 1 to	..	31	4	1856
One fixed bright light	14 41.5	April 14				
Stamsund	68 7.2	Tornholm, S. Point. Sept. 1 to	..	56	7	1859
One fixed bright light	13 53.	April 14				
Hammerfest	70 40.2	Extremity of Fuglenæs Island.	6a	30	11	1859
One fixed bright light	23 40.	Aug. 25 to April 20				
Vaag, or N. Hellig Vær	67 26.	N.E. Point of Island. Aug. 15	5a	45	12	1859
One fixed bright light	14 1.7	to May 1				
PRÆSTØ, Folden Fiord	64 43.4	On the Islet. August 1 to May	6a	36	12	1841
One fixed bright light	10 46.1	16				
VILLA	64 32.7	On the Island. A flash every	2d	127	20	1859
One fixed and flash. lt.	10 41.7	4 min. August 1 to May 16				
Munk Holm	63 27.2	On the Fortress. August 1 to	6a	44	10	1840
One fixed bright lt.	10 24.8	May 16				
Agdenæs	63 38.2	On the Point. August 1 to	..	116	9	1831
One fixed bright lt.	9 49.5	May 16				
Terningen	63 29.6	On the Island. August 1 to	5a	100	12	1849
One fixed bright light	9 9.	May 16				

	Name and Character of Light.	Lat. N. Long. E. ° °	Description, &c.	Description of Apparatus.	Height above H. W.	Visible in Miles.	Year established.
1842	TRONDHJEM One fixed bright light	63 18.7 8 13.4	On the Ringholm Rock, half mile from E. Pt. of Eddo. Aug. 1 to May 16	5a	51	14	1849
1842	Leervig One fixed bright light	63 6.5 7 42.	On N. side of Island. Aug. 1 to May 16 .....	..	..	..	1833
1842	CHRISTIANSUND One fixed bright light	63 7.3 7 38.2	On Stavnes, N.E. Point of Averö. Aug. 1 to May 16	5a	65	12	1842
1842	QVITHOLM One fixed and flash. lt.	63 2.2 7 12.5	On N.W. Pt. of Id. A flash of 12 secs. every minute. Aug. 1 to May 16	2d	134	19	1842
st. 1859	Walderhoug One fixed bright light	62 30.1 6 7.4	On S. Pt. of Walderö. Aug. 1 to May 16 .....	..	41	4	1860
1859	LEPSØ REEF LT. VESSEL One fixed bright light	62 35.5 6 14.5	In 3 fms. on S.E. part of Reef. Aug. 1 to May 16 .....	..	25	4	1858
1857	HOGSTEN One fixed and flash. lt	62 28. 6 1.5	Flash every 3 min. On S.E. of Godü Id., Bred Sound. Aug. 1 to May 16	4d	41	12	....
1857	RONDÖ One fixed bright light	62 25. 5 35.1	W. Pt. of Id., Bred Sd., Aug. 1 to May 16 .....	..	161	22	1858
1857	HELLESÖ ISLAND One fixed and flash. lt.	60 45. 4 43.1	Flash 12 secs. every min.; at 8 m. dist. dark between flashes	2d	154	19	1855
1856	SKÆLLANGER One fixed bright light	60 36.5 4 57.3	N.W. side of Holzenö Id. July 15 to May 16	5a	58	13	1853
1856	BERGEN One fixed bright light	60 24. 5 18.7	On Nordnæs Point. Aug. 15 to April 30 .....	..	41	4	1839
1859	Leerøen Island One fixed bright light	60 14. 5 11.	W. side of Island. July 15 to May 16 .....	..	57	4	1855
1859	Piir Holm One fixed bright light	60 5.2 5 12.3	Bagholm Sound. July 15 to May 16 .....	..	..	4	1819
1859	Öxhammar One fixed bright light	59 59.2 5 14.	E. side of Selbö. July 15 to May 16 .....	..	..	4	1860
1859	SLOTTERÖ, SFLBÖ FIORD. One fixed bright lt.	59 34.5 5 5.	On the Island. South entrance	2a	152	18	1859
1841	Folgerøen One fixed bright light	59 48. 5 20.	On Island at Stoksund. July 15 to May 16 .....	..	51	4	1855
1859	Midholmen One fixed bright light	59 42. 5 24.7	Mosterhavn. July 15 to May 16 .....	..	39	4	1855
1840	Længevaad One fixed bright light	59 37. 5 16.	Lille Bleigan. E. side of Bommelö Id. July 15 to May 16 .....	..	16	3	1855
1831	Espevär One fixed bright light	59 35.1 5 10.1	S. entrance of Harbour. Oct. 1 to April 1 .....	..	..	4	1849
1849	Ryvarden One fixed bright light	59 31.7 5 14.7	On Point leading into Bommel Fiord. July 15 to May 16 ..	..	..	4	1849

Name and Character of Light.	Lat. N. Long. E. ° °	Description, &c.	Description of Apparatus	Height above H.W.	Visible in Miles.	Year established.
Gitterö One fixed bright light	59 26. 5 8.5	Removed from Gletta. Vis. from N. to S.W. & W., by the E. . .	..	..	4	1860
SÄRHOUG One fixed bright light	59 25.2 5 15.5	On Rock at N. entrance	5a	72	12	1846
Hüievarde One fixed bright light	59 19.5 5 20.3	E. side of Karmö .....	..	65	6	1858
UDSIRE Two fixed bright lights	59 19.6 4 51.1	W. side of Id. N.W. and S.E. 220 yards apart	2a | 255 | 21	1844		
Bukke Sund One fixed bright light	59 13.2 5 29.	E. side of Bukken Island. Oct. 1 to April 1 .....	..	..	4	1849
Fieldo Island	.....	One fixed br. lt. Oct. 1 to April 1	..	..	4	1849
Skude Ness Havn	.....	One fixed br. lt. Oct. 1 to April 1	..	..	4	1849
Skude Ness One fixed bright light	59 9.2 5 17.	S.E. Point of Karmö. Oct. 1 to April 1 .....	..	77	6	1840
Tunge Ness One fixed bright light	59 2. 5 36.7	October 1 to March 31 .....	..	25	6	1840
HVIDINGSÖ One fixed and flash. lt.	59 4. 5 23.1	Fixed lt. 2m. 55 secs.; then short eclipse; then br. flash 10 to 15 secs.; then eclipse. Only flashes seen 16 m. dist. Revs. in 4 m.	2d | 149 | 21	1853		
LILLE FEISTEEN One fixed red light	58 49.5 5 30.7	On the Island	4a	68	12	1859
EGERÖ GRUNDSUND HOLM One fixed br. light	58 27.8 5 53.1	On N.W. Point	5a	43	11	1855
W. POINT OF ISLAND One fixed br. light	58 26. 5 52.2	.....	1a	154	24	1854
VIRBERODDEN One fixed br. light	58 25.3 5 59.6	S.E. Point of Vibber Odde	5a	73	12	1855
VARNÄS One fixed bright light	58 10.6 6 37.3	S. Point of entrance to Lister Fiord .....	..	90	12	1836
LISTER Three fixed br. lights	58 6.5 6 34.2	Three white towers built in a triangle, on W. Pt. of Lister Land	2a | 130 | 19	1853		
NAZE OF NORWAY or LINDESNÆS One fixed & flash. lt.	57 59. 7 3.	White and red tower, 33 ft. high, on the Cape. Flash of 12 secs. every minute	1d | 164 | 24	1853		
ODDERÖ ISLAND One fixed red light	58 8.2 8 0.5	In Christiansand Fiord, on S.W. Point of Island .....	..	27	10	1832
OXÖ ISLAND One fixed bright light	58 4.4 8 3.6	Round white tower on S. of Id., entrance of Christiansand Fiord	2a | 139 | 19	1853		
ARENDEL One fixed bright light	58 26.3 8 47.4	Yellow building on Sandvig Pt., W. side of Channel	6a	43	11	1844

Name and Character of Light.	Lat. N. Long. E. o ,	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
TORUNGEN ISDS. Two fixed bright lights	58 24.1 8 47.7	On Outer Torungen, and Inner Torungen, N.N.E. 1,200 yds. apart	2a |	134 | 20 |	1844	
Stangholms Island One fixed red light	58 42.7 9 15.	Yellow building on E. Point ..	5a |	34 | 10 |	1855	
JOMFRULAND One fixed and flash. lt.	58 52.2 9 86.3	White tower, 86 ft. high, on a low Island. Flash every $\frac{1}{2}$ min. Dark between flashes at 8 m.	2d |	134 | 20 |	1839	
LANGÖTANGEN One fixed bright light	58 59.7 9 45.8	Yellow tower on S. Point of Langö Island	6a |	41 | 11 |	1839	
Frederiksværn One fixed green light	58 59.5 10 4.5	Staværnsø, S. Pt., E. side of Channel. July 15 to June 1	.. | 101 | 8 |	1855		
CHRISTIANIA FJORD.						
FÆRDER One fixed bright lt.	59 2. 10 32.1	Red tower, 134 ft. high, with white belt, on Lit. Færder. Fog bell	1a | 154 | 24 |	1857		
TORGAUTEN ISLAND One fixed bright lt.	59 9.5 10 50.3	On S. Point .....	.. | 37 | 12 |	1859		
FULEHUK ISLAND One fixed & flash. lt.	59 11. 10 36.7	White tower, 41 foot high. Flash every 3 minutes	4d | 67 | 14 |	1850		
Torgersø Island One fixed bright lt.	59 15.5 10 30.9	On N.W. Point. July 15 to June 1 .....	.. | 10 | 8 |	1851		
Moss Havn One fixed red light	59 26.4 10 39.8	E. side of Canal. October 1 to March 31 .....	.. | 10 | 3 |	1857		
BASTØ ISLAND One fixed bright lt.	59 23.3 10 33.	Yellow building on N. E. Point	6a | 38 | 12 |	1848		
Röd Point One fixed bright lt.	59 31.9 10 26.3	E. side of entrance to Drams Fiord. July 15 to May 31 ..	.. | 35 | 6 |	1840		
Filtvedt One fixed bright lt.	59 34.7 10 37.7	On W. shore. July 15 to May 31 .....	.. | 24 | 6 |	1840		
Steilene Island	.....	One fixed light. July 31 to May 31	6a | 22 | 6 |	1837		
Heg Holm	.....	One fixed light on N. Pt. July 15 to May 15	6a | 23 | 4 |	1826		

Name and Character of Light.	Lat. N. Long. E. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
SWEDEN.						
KOSTER	58 14.2	N. and S., 78 yards apart. Flash	...	214	15	1850
One fixed and flash. lt.	11 0.	in 7 secs.				
One fixed bright light						
HÄLLÖ	58 20.5	White tower, at entrance of Aby	...	110	10	....
One fixed and flash. lt.	11 13.	Fjord. 9 flashes in 6 min.				
THE KATTEGAT.						
MARSTRAND	57 53.5	On Tower of Karlsten Fort ....	...	282	22	1836
One rev. br. lt., 2 min.	11 35.					
WINGA, or VINGA ID.	57 38.	N.E. $\frac{1}{2}$ N., and S.W. $\frac{1}{2}$ S., 138	...	81	15	1854
One fixed and flash. lt.	11 36.	yards apart. Rapid flashes ..				
One fixed bright light						
BUSKÄR ISLET	57 38.3	At a distance br., but red when	...	82	10	1841
One bright or red light	11 40.	near. Aug. 15 to April 15 ..				
BÜTRÖ	57 39.	On a house; in Winga Sound.	...	45	10	1841
One fixed bright light	11 43.	Aug. 15 to April 15				
NIDINGEN ROCK	57 18.5	Stone towers, E.N.E. and W.	...	66	12	1832
Two fixed bright lts.	11 53.5	S.W., 53 yards apart. Fog bell in a steeple				
MORUP TÄNGE PT.	56 55.	White tower, 70 feet high, on	...	95	15	1843
One fixed bright light	12 22.	the Point				
KULLEN	56 18.2	White tower, on hill-side. Br.	...	288	20	1843
One rev. bright light	12 27.	30 secs., dark $1\frac{1}{2}$ min.				
Helsingborg	56 3.	Stone tower, 23 feet high, on N.	...	27	7	....
One fixed bright light	12 42.	Pier Head				
Helsingör, or Elsinore	56 2.1	On S. Pier .....	...	17	7	1830
One fixed bright light	12 37.5					
NAKKE HEAD	56 7.2	On N.E. Point of Sjælland, W.	...	147	12	1772
Two fixed bright lights	12 20.8	N.W. & E.S.E., 438 yds. apart	..	98	8	
HIELM ISLAND	56 8.	Flash every fourth min. ....	...	164	18	1856
One fixed and flash. lt.	10 48.5					
SPOTSBERG	55 58.6	On E. side of entrance to Ise	...	123	10	1845
One fixed bright light	11 51.6	Fjord.....				
HESSELÖ ISLAND	56 11.8	Strong lt., 11 secs.; weaker, 19	...	87	14	1841
One rev. br. lt., 1 min.	11 42.8	secs.; invisible, 11 secs.; then weak light, 19 secs.				
FORNESS	56 26.7	2½ miles N.E. $\frac{1}{2}$ E. of Greenaa	...	69	13	1839
One rev. br. lt., $\frac{1}{2}$ min.	10 57.5	Haven				
ANHOLT LIGHT VESSEL	56 45.7	In 16 fathoms, 1 mile E. of Knob	...	26	9	1842
One rev. br. lt., 26 secs.	11 50.8	Reefs. March to December..				

1850

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1836

1854

1841

1832

Name and Character of Light.	Lat. N. Long. E. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
ANHOLT ISLAND One rev. br. lt., 25 secs.	56 44.2 11 39.2	E. Point. A light is shown 57 ft. lower when Lt. Vessel is not in her station .....	...	122	14	1852
KOBBERGROUND LT. VES. Three fixed bright lts.	57 8.5 11 20.5	In 4 fms., S.E. by S., from Nyvager. Lights triangular.....	..	41 29	8 ...	1863
Hals, N. Pier One fixed bright light	57 0. 10 19.	Entrance of Liim Fiord.....	..	32	10	1846
LÆSO CHAN. LT. VESSEL One fixed bright light	57 12.7 10 41.6	In 10 fathoms, E. of Dvale Ground.....	..	30	9	1852
TRINDELEN LT. VESSEL One fixed bright light	57 25.6 11 16.6	Red, with white cross; a red ball at the fore. Bell in fogs	•	31	9	1829
Frederikshavn One fixed bright light	57 26.2 10 32.9	On S. Pier Head.....	..	23	8	1134
HIRTSHOLM One rev. br. light, $\frac{1}{2}$ m.	57 29.2 10 27.4	White tower, quadrangular .....	..	43	10	1838
Aalbek	.....	Two fishermen's lights .....	..	12	5	1846
SKAGEN, or SCAW One fixed bright light	57 44.1 10 37.9	Ice signals shown	1a	144	15	1564 1858

THE SOUND.

1843

1843

....

1838

1830

1772

1856

1845

1841

1839

1842

Landskrona One fixed bright light	55 52. 12 50.	N. side of Harbour .....	..	..	..	....
KRONBORG One fixed bright light	56 2.4 12 37.6	On N.E. tower of Castle .....	..	110	15	1843
COPENHAGEN One fixed and flash. lt.	55 42.2 12 37.	Flash every 3 min., E. side of Tre Kroner Battery	4d	41	11	1858
DRAGØR, or DROGDEN, LT. VESSEL One fixed bright lt.	55 33.2 12 43.3	200 yds. S.W. by S. of Quartus Ground, in 4½ fathoms. March 1 to December 31 .....	..	25	9	1838
MALMO One fixed bright light	55 36.7 13 1.	Tower, on W. Pier Head .....	..	..	..	....
FALSTERBO One fixed bright light	55 23.7 12 49.8	Stone tower, 68 feet high, within the Roof. Aug. 1 to May 15 .....	..	78	13	1843
FALSTERBO LT. VESSEL Two fixed bright lts.	55 17. 12 48.	In 5 fathoms, at extreme Point of Reef .....	..	49	6	1844
Kjøge Pier Two fixed bright lts.	55 27.1 12 11.5	.....	..	39 33	6 ~	1842
STEVNS CAPE One rev. br. lt., $\frac{1}{2}$ min.	55 17.4 12 27.5	1,506 yards N.E. of Hoierop Church .....	..	144	16	1818
MÖEN ISLAND One fixed bright light	54 56.8 12 32.7	S.E. Point .....	..	82	12	1845
GIEDSER POINT One fixed bright light	54 33.8 11 58.	½ mile inland of S. Point of Falster Island	3a	66	12	1851

Name and Character of Light.	Lat. N. Long. E. °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
GREAT BELT.						
SEIRO	55 55.2	Tower, 52 feet high, on N.W.	...	103	15	1852
One rev. br. Lt., 2 min.	11 5.1	Point of Island				
REEF NESS	55 44.6	On extreme Point .....	...	65	13	1844
One fixed bright light	10 53.4					
Kallundborg	55 41.2	On the Pier .....	...	25	9	1835
One fixed bright light	11 5.8					
HALSKOV	55 20.3	Near Korsör. A second light is	...	62	10	1727
One fixed bright light	11 7.7	shown occasionally. Aug. 1 to May 15				
KORSÖR	50 20.2	N. side of Harbour.....	4a	26	8	1848
Two fixed bright lights	11 8.5			17		
SPROGÖ	55 19.9	On highest part of Island .....	...	60	12	1750
One rev. br. Lt., 15 secs.	10 58.4					
KNUDS HEAD	55 17.4	May 15 to July 31 .....	...	60	10	1750
One fixed red light	10 51.3					
SLIPSHAVN	55 17.1	On Slips Point Battery, Nyborg	...	20	8	1845
One fixed red light	10 49.7	Fjord.....				
Nyborg Harbour	55 18.8	On Pier Head, when the Mail is	..	18		....
Two fixed bright lights	10 48.	expected		6	4	
AGERSÖ	55 11.1	S. Point of Helleholm, Omö	..	25	8	1848
One fixed red light	11 12.7	Sound				
VÆIRÖ	55 2.3	On N.E. Point of Island .....	..	51	10	1845
One rev. br. Lt., $\frac{1}{2}$ min.	11 22.3					
TAARS	54 52.7	On N.W. Point of Laaland; E.	6a	32	8	1857
Two fixed bright lts.	11 2.3	$\frac{1}{2}$ S., 663 yards apart		18	5	
Svendborg	55 3.	On the Pier, October to March	..	14	6	1854
One fixed bright light	10 39.					
LITTLE BELT.						
AARHUS	56 9.3	On S. end of Mole. Red light	..	34	10	1846
One fixed bright light	10 13.5	also on N. Pier				
THUNÖ	55 57.	On Church Tower, S.E. of	..	100	11	1846
One fixed bright light	10 26.8	Island				
SAMSO ISLAND	55 46.3	S.W. Point. Flash every third	3d	118	15	1858
One fixed and flash. Lt.	10 33.4	minute				
Fredericia	55 33.6	On N. Mole .....	..	28	4	1842
One fixed bright light	9 45.7					
Middelfort	.....	Lt. on Pier Head, on dark nights	..	..	..	....
BAAGÖ ISLAND	55 17.7	On S.W. Point .....	..	39	10	1842
One fixed bright light	9 48.					
Assens	55 16.3	On Pier Head .....	..	20	5	1854
One fixed bright light	9 53.7					

DENMARK.**LIGHTHOUSES.****Little Belt.**

61

	Name and Character of Light.	Lat. N. Long. E. ° °	Description, &c.	Deseruation of Apparatus	Height above H. W.	Visible in Miles.	Year established.
1852	Aarö Island	.....	A Lantern, on S. end, occasionally .....	...	...	...	....
1844	Aarö One fixed bright light	55 15.7 9 42.9	On S. Mole. November to May	...	26	6	1777
1835	Apenrade One fixed red light	55 2.5 9 26.	On S. Mole. From Sept. 15 to April 1, till 1 a.m. ....	...	16	5	....
1727	ALS One fixed bright light	54 51.3 9 59.3	Koke Ness, S.E. Point of Alsen Island .....	...	78	12	1845
1846	Eckenförde One fixed bright light	54 28.3 9 50.3	On Pier Head .....	...	...	...	....
1750	BULK One fixed bright light	54 27.4 10 11.9	W. Point of entrance to Kiel Bay .....	...	55	12	1815
1750	FRIEDRICHSPORT Two fixed bright lights	54 23.5 10 11.3	On Fortress, W. side of Kiel Bay. E.S.E., 250 yards apart	...	33	9	1815
1845	Düsternbrook One fixed red light	54 21. 10 9.	On iron tower, at the bathing place .....	...	16	6	1854
1846	MARIEN One rev. br. lt., $\frac{1}{2}$ min.	54 29.6 11 14.5	N.E. Point of Femern Island .....	...	94	14	1832
1846	FAKKEBIEBERG One fixed bright light	54 44.4 10 42.2	On a hill, 1 mile N. of S. Point of Langeland .....	...	128	14	1806
1845	NEUSTADT One rev. br. lt., 2 min.	54 5.3 10 51.8	2 miles S.E. by E. of entrance to Neustadt, on Pelzer Point....	...	47	10	1842

SWEDEN.**Baltic, W. Shore.**

1857	Ystad Harbour One red and bright lt.	55 25.5 13 50.	Red light on W. Pier Head. N.E. by N., and S.W. by S., 48 yards apart .....	...	20	4	1847
1854	ULKLIPPOR ROCKS One rev. br. lt., 2 min.	55 57. 15 43.	Stone tower, on the Rocks ....	...	50	11	1340
1846	Grimskär One fixed bright light	56 39.3 16 23.3	On Pilot's house. Sept. 15 to April 15 .....	...	41	6	1837

ÖLAND ISLAND

1846	S. POINT OF ISLAND. One fixed bright lt.	56 11.8 16 24.5	White stone tower, 116 ft. high, on the Point .....	...	133	17	1785
1858	BJÖRNHABBEN ROCK One fixed bright lt.	57 22. 17 6.5	Off N.W. Point of Island .....	...	103	12	1845

GOTTLAND

1842	HOBURG HILL One rev. br. lt., $1\frac{1}{2}$ m.	56 55. 18 8.4	S.W. Point of Island .....	...	166	16	1846
1842	ÖSTERGARN ISLAND One fixed bright lt.	57 26.5 19 0.	Tower, 66 feet high	3a	101	14	1817
1854	FÄRÖ ISLAND One rev. br. lt., $1\frac{1}{2}$ m.	57 57.4 19 23.3	Tower, 49 feet high, on Holm Pt. Very brilliant for 20 secs. ....	...	100	14	....

Name and Character of Light.	Lat. N. Long. E. o	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
GOTTSKA SANDÖ ID. Two fixed bright lights	58 23.2 19 12.7	On N. part of Island. N. 5° W., and S. 5° E., 260 yards apart	3a	140	16	....
LANDSORT ISLAND One rev. br. lt., 2 min.	58 44.5 17 52.7	Stone tower, 85 feet high, on S. Point of Island .....	..	144	18	1860
KORSÖ ISLET One rev. br. lt., 4 min.	59 17.2 18 58.3	Alternate flashes and darkness..	..	151	17	1768
GRÖNSKÄR ROCK One fixed light	59 17.3 19 3.	Coal fire on tower, 68 feet high	..	111	15	1786
SÖDERARM One rev. br. light, 2 m.	59 45.4 19 28.	White tower, 66 feet high, on Tollskar. Intervals of darkness	..	99	14	1839
NÄSKUBBEN ROCK One fixed bright light	59 52.7 19 5.5	Off Biörkö .....	..	21	9	1850
Grissel Hamn .....	.....	Light occasionally on Beach ..	..	..	..	....
SVARTKLUB ROCK One rev. bright light	60 10.3 18 50.	In the S. Quarkon. White tower, 54 feet high, on the Rock .....	..	68	13	1819
UNDERSTEN ROCK One fixed bright light	60 16.3 18 55.3	In the S. Quarken. Tower, with bands, 35 ft. high, on the Rock	..	78	12	1848
DIURSDEN One fixed bright light	60 22. 18 24.3	White tower, 52 ft. high, on W. Pt. of Gräsö Id., in Öre Grd. B.	..	65	12	1830
ÖRSKÄR ISLAND One rev. br. lt., 1 min.	60 31.5 18 22.2	White tower, 110 feet high, on the Island .....	..	118	16	1739

GULF OF BOTHNIA.

Eggeregrund	60 43.4 17 32.	Light, on roof of a house .....	..	52	9	1838
BJÖRN ROCK Two fixed bright lts.	60 37.7 17 59.5	One on tower, the other on Keeper's house .....	..	42	11	1859
BÖNAN One fixed bright light	60 43.9 17 18.7	Near the Custom House .....	..	62	6	1840
STOR JUNGFRUN One fixed bright light	61 9.9 17 21.	Tower, 56 feet high, on E. side of Island .....	..	86	14	1838
BRÄMÖ ISLAND One fixed bright light	62 13.3 17 37.	N.E. Point of Island	2a	101	17	1859
HOLMÖ GADD One fixed bright light	63 35.8 20 47.5	Tower, on Holmö, S. Gadd Rocks. Strong light to S.S.W. $\frac{1}{2}$ W.	..	70	12	1828
UMEA One rev. br. lt., 2 min.	63 47.8 21 1.	In the N. Quarken; on Fjeder- üggä Great Rock .....	..	101	15	1851
BIURÖ One fixed bright light	64 29.2 21 35.7	On the Head	2a	171	18	1859
HAPARANDA AND TORNEA One fixed bright light	65 31.7 23 36.	On Malören Rock .....	..	78	10	1851
NORR-SKAREN One rev. br. lt., 1 min.	63 14.1 20 37.7	On W. Islet .....	..	103	12	1848
OESTRA FINNGRUND LT.V. One fixed bright light	60 55.5 18 26.	1½ mile S.E. of shoalest part ..	..	..	10	1859
ENSKAR ISLAND One fixed bright light	60 43. 21 1.	Tower, 120 feet high, on the Id., 9 miles N.W. of Loperton....	..	152	14	....
LAGSKAR One fixed bright light	59 50.8 19 55.8	Tower, 89 feet high, on N. Point	●	101	14	1859

GULF OF FINLAND. Lighthouses.

North Shore. 63

Year established.

Name and Character of Light.	Lat. N. Long. E. o	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
OUTO or UTÖ One fixed bright light	59 46. 21 22.2	Gray tower, 93 feet high, on middle of Island	•	130	13	....
HANGÖ One revolving lt. 1 min., flashes unequal	59 46. 22 57.2	Wooden tower red, 71 ft. high, on S. Point of Id., 3 miles S. $\frac{1}{2}$ W. of Hangö Head	•	101	12	....
RENSKAR One fixed bright light	59 56.2 24 24.7	Granite tower, 58 ft. high on the Scar, $1\frac{1}{4}$ miles S. $\frac{3}{4}$ W. of Porkala Point .....	..	172	15	....
GLOSHOLM One rev. bright light	60 11.2 25 51.4	On Id. S. of Pollinge. Br. 20 secs., dark 40 secs. May 28 to July 13	..	120	12	1826
KALBADEN-GRUND LT. V. One fixed bright light	59 58.5 25 36.5	S. side. Ball at Mast Head .....	..	..	..	1858
South Shore.						
NEVA LIGHT VESSEL One fixed bright light	59 55.3 30 10.6	Entrance of Ship Channel to Petersburg. May 28 to July 13	..	67	6	1858
YELAGUIN LIGHT VESSEL One fixed bright light	59 58.3 30 1.5	Entrance of N. Channel to Petersburg. May 28 to July 13	..	16	5	....
Peterhof Two fixed bright lights	59 53.5 29 56.7	Two Pillars on end of Pier. May 28 to July 13 .....	..	34	6	....
Oranienbaum One fixed bright light	59 55.9 29 47.7	W. Pier. May 28 to July 13. Fog bell .....	..	45	6	....
Friderikstadt One fixed bright light	59 58.2 29 48.4	Angle of Kronstadt Harbour. May 28 to July 13. Fog bell	..	38	6	....
KRONSTADT Merchant's Gate One fixed br. light	59 58.9 29 46.6	Mole Head. May 28 to July 13	..	24	5	....
One fixed red and one bright light	.....	Bright lt. on S. Bastion of Nicholas Battery. Red light on Kronsloft, W. Rampart. May 28 to July 13 .....	..	58	12	1857
23 | 1828				23	8	
TOLBOUKIN One fixed bright light	60 2.6 29 33.8	White tower, 88 feet high, on an Islet, W. of Kronstadt Island. May 28 to July 13 .....	..	95	11	1832
1859						
LONDON SHOALS LT. VES. Three bright fixed lts.	60 0. 29 31.	Set triangularly. May 28 to July 13 .....	..	41	7	1858
28 | 1851				28	6	
NARVA One fixed bright light	59 28.1 28 3.7	White tower, 67 feet high, at S. Point of entrance to River. May 28 to July 13 .....	..	70	9	....
1859						
SESKÄR One fixed and flash. lt.	60 0.1 28 23.	Brighter flash every half minute, with short eclipses	2d	97	14	1858
1859						
SOMMARS One fixed bright light	60 12.2 27 39.8	On W. Hill of Island. May 28 to July 13 .....	..	85	10	....

Name and Character of Light.	Lnt. N. Long. E. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
HOGLAND Two fixed bright lights	60 5.7 26 38.4	On N. Point of Id., and on adjacent Hill. N. by E. $\frac{1}{2}$ E., and S. by W. $\frac{1}{2}$ W., 1,250 yards apart. May 28 to July 13 ..	..	388 37	22 6	....
RÖDSKÄR One rev. br. lt., 1 min.	59 58.1 26 41.1	Black wooden building, 62 feet high, on Id. May 28 to July 13	..	74	9	....
KALK-GROUND LT. VES. One fixed red light	59 42. 26 6.	May 28 to Oct. 15. Yellow flag, and red and white balls.....	..	..	..	1868
EKHOLM One fixed bright light	59 41. 25 49.	Iled stone tower, 72 ft. high, on N. Pt. of Id. May 28 to July 13	..	101	14	1851
KOKSKÄR One fixed bright light	59 41.7 25 1.5	Tower, 97 feet high, on the Rock	2a	100	15	1858
REVEL, or KATERINDAL						
PORT MILITAIRE Two red and 2 br. lts.	.....	Bright light at E. Pass, end of Mole; red lt. at S. Pass; br. lt. at W. Pass, end of Mole; red lt. at S. Pass. All on the wall	..	..	3	1859
MOUNT LAKSBERG Two fixed bright lts.	59 26.3 24 49.2	One near Marine Barracks; the other behind Katerindal. S. by E. and N. by W., 1,167 yards apart. May 28 to July 13 ..	..	178 268	15 19	....
REVELSTEIN LT. VESSEL Two fixed bright lts.	59 43.3 24 44.	N. side. May 28 to Nov. 1. Yellow flag; bell in fogs .....	..	..	..	1858
NARGEN One rev. br. lt., 1 min.	59 36.4 24 31.9	Gray tower, 124 ft. high, on N. of Id. Vis. 10 secs., dark 50 secs. May 28 to July 13 .....	..	136	13	1828
SOUROP Two fixed bright lights	59 27.9 24 24.1	On N. Cliff of Cape, and 1 $\frac{1}{2}$ min. E. of Old Tower. In one, E. by N. $\frac{1}{2}$ N. .....	..	135 28	13 10	....
PAKER ORT One fixed bright light	59 30.5 24 2.	Stone tower, 75 feet high, on Cape. May 28 to July 13....	..	..	14	....
ODENSHOLM One fixed bright light	59 18.3 23 22.2	Red tower, 81 feet high, on N.W. of Id. May 28 to July 13 ..	..	102	16	1852
DAGER ORT One fixed and flash. lt., 1 min.	58 55. 22 15.2	White tower, 110 feet high, on a hill, 5 miles inland of W. Point of Dagö Id. May 28 to July 13	1d	328	21	1860

GULF OF RIGA

Pernau Two fixed lights	58 23. 24 30.	Two Lanterns, near S. entrance. May 28 to July 13 .....	..	..	..	1853
RIGA Two fixed bright lts.	57 3.9 24 1.	In same tower, on Dvinaminde Fort, Mouth of Dvina. May 28 to July 13 .....	..	95 90	11 5	1818
RUNÖ One fixed bright light	57 48.1 23 15.5	Yellow building, 102 ft. high, on S.E. of Id. May 28 to July 13	..	200	16	1860

BALTIC SEA.

LIGHTHOUSES.

South Shore. 65

	Name and Character of Light.	Lat. N. Long. E. ° °	Description, &c.	Description of Apparatus	Height above H.W.	Visible in Miles.	Year established.
2 | ....	DOME NESS LT. VESSEL One rev. bright light	.....	933 yards from Reef. May 28 to July 13 .....	.. | .. | ..	1858		
3 | ....	DOME NESS Two fixed bright lights	57 45.6 22 37.5	On extremity of Ness. S.S.W. $\frac{1}{4}$ W., 106 yards apart. May 28 to July 13 .....	.. | 86 | 8 79 | 10			
9 | ....	FILSAND ISLAND One rev. br. lt., 3 min.	58 23. 21 49.9	On W. Point. Br. 2 min., dark 1 min. May 28 to July 13 ..	● | 127 | 13 1824			
1858 | .	SWALFER ORT One rev. bright light	57 54.6 22 4.5	White tower, 114 ft. high, on S. Pt. of Osol Id. May 28 to July 13 .....	● | 120 | 12 1838			
4 | 1851	LYSER ORT One fixed bright light	57 34.2 21 44.1	White tower, 120 ft. high, 1,100 yards in shore. May 28 to July 13	2a | 127 | 13 1845			
5 | 1858	MEMEL One fixed bright light	55 43.7 21 6.2	N.E. side of entrance. Aug. 1 to May 15 .....	.. | 98 | 20 1860			
3 | 1859	BRÜSTEE ORT One rev. br. lt., 4 min.	54 57.7 19 59.2	On the Cape	2b | 143 | 20 1841			
3 | 1859	PILLAU One fixed bright light	54 38.3 19 54.2	Round tower, 88 feet high, S.E. of town. Aug. 1 to May 15..	.. | 92 | 20 1841			
15 | ....	DANZIG Two fixed bright lights	54 24.3 18 40.2	On Neufahrwasser Tower and E. Mole, N. & S., 1,647 yds. apart	.. | 75 | 14 61 | 10 1841 | 1839			
19 | 1859	HELA One rev. br. lt., $\frac{1}{2}$ min.	54 36.1 18 49.3	Four cables, N.E. $\frac{1}{2}$ E., from Point .....	.. | 120 | 16 1840			
.. | 1858	RIXHÖFT One fixed bright light	50 50. 18 20.7	N. Point of Prussian Pome- rania .....	.. | 220 | 22 1840			
13 | 1828	IERSHOFT One rev. br. lt., 2 min.	54 32.7 16 33.	Stone Building, 93 feet high, near the village. Bright, 70 secs.; dark, 50 secs. .....	.. | 160 | 18 1838			
13 | ....	SWINEMÜNDE One fixed bright light	53 55. 14 17.6	Port of Stettin, Oder R. Br. lt. on E. side of Harb. 1 mile S. of red lt. on E. Mole Head ..	1a | 211 | 21 .. | 39 | 10 1855 | 1857			
10 | 1859	One fixed red light						
14 | ....	GREIFSWALD One rev. br. and red lt., $1\frac{1}{2}$ min.	54 14.7 13 55.4	On N.E. part of Island .....	.. | 154 | 17 1840			
16 | 1852	ARKONA One fixed bright light	54 41. 13 26.2	On Wittow Peninsula .....	.. | 200 | 22 1828			
21 | 1860	DARS POINT One rev. & 1 fixed br. lt.	54 28.9 12 31.	High light, revolves every min.	2b | 108 | 16 .. | 41 | 12 1848			
1 | 1853	WARNEMÜNDE One fixed bright light	54 10.5 12 5.7	W. side of entrance. Aug. 1 to April 30. (Tide signals.) ....	.. | 58 | 12 1838			
5 | 1818	TRAVEMÜNDE Two fixed bright lights	53 59. 10 53.	N. Point of River, 1 mile below Travemünde .....	.. | 100 | 16 68 | 6 1827			
6 | 1860	BORNHOLM CHRISTIANSÖ, OF ERTHHOLMS One rev. br. lt., 20 s.	55 19.3 15 11.6	On Round Tower of fortress....	.. | 94 | 14 1805			
	HAMMAR POINT One fixed bright lt.	55 17.4 14 47.3	On Steilberg, near N. Point of Island .....	.. | 279 | 14 1802			
	Rönne Harbour Two fixed bright lts.	55 5.8 14 42.5	In the Harbour .....	.. | 52 | 8 29 | 20 1848			

Name and Character of Light.	Lat. N. Lang. E. o °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
SKAGEN, or SCAW One fixed bright light	57 44.1 10 37.9	Ice signals shown. Red ball on the Old Lt. H. if the Læsø Lt. Vessel is not at her station ..	1a	144	15	1858
HANSTHOLM One rev. br. Lt. $\frac{1}{2}$ min.	57 6.8 8 36.2	N.W. Point of Jutland .....	..	218	18	1843
Agger Chan. Lt. VESSEL One fixed bright light	56 45.5 8 10.5	Within the Channel. Nov. 1 st to March 20.....	6a	30	10	1860
SYLT Two fixed lights One fixed and flash. light	55 3.5 8 24.	Two fixed lts. (the Western redish) on List or N. end of Id. S.E. by E. $\frac{1}{4}$ E., 2,910 yards apart. The fixed lt. will flash every 4 m., in village of Kamp, and changes to red when over the Bar.....	4a	63 72 205	10 13 20	1852
Dagebüll Two fixed bright lts.	54 43.7 8 41.3	On the Dyke .....	..	..	5	1854
Föhr Island Two fixed bright lts.	54 41.5 8 34.3	Wyk Harbour. In one lead in	..	..	5	1852
AMRUM ISLAND. One rev. br. Lt. $\frac{1}{2}$ min.	54 38.5 8 22.5	On the Island .....	..	140	14	1853
EIDER LT. VESSEL One fixed bright light	54 10.7 8 34.6	In 4½ fms. at Mouth of River. Has two masts and flag.....	..	34	10	1805

River Elbe.

I. Outer Light Vessel Three fixed br. lts.	54 0.1 8 18.2	In 11 fms. Three Masts; a light on each, and red flag at Main	..	..	3	....
Loots Galliote Lt. Ves. One fixed bright lt.	.....	Pilot Vessel, 1½ miles from Outer Vessel .....	..	..	..	....
II. Middle Light Vessel Two fixed lights	.....	Three Masts; blue and white flag at Main. $\frac{1}{4}$ m. from Pilot Vess.	..	31	3	1839
III. Inner Light Vessel	.....	One fixed br. lt. Three Masts; red flag, with wh. square at M.	..	29	..	1857
NEUWERK Two fixed bright lts.	53 55. 8 30.	On Id. at entrance to River. S. by E. $\frac{1}{4}$ E., 685 yards apart ..	..	120 60	15 12	1814 1815
Kugel Baak One fixed bright light	53 53.5 8 41.7	Shows inside the Beacon, from N.W. $\frac{1}{4}$ N., and N.W. .....	..	..	..	1853
CUXHAVEN One fixed and flash. lt.	53 52.3 8 43.	Brick tower, 66 ft. high, W. side of entrance. It is a fixed lt. up the River .....	..	80	12	1853
Böschen One fixed bright light	53 53.7 9 15.	On E. side, when River is free from ice .....	..	..	..	....
Storens One fixed red light	53 50. 9 24.3	N. Pier, at entrance of River Stor .....	..	32	6	1805
Glückstadt One fixed red light	53 47.1 9 24.5	On N. Pier .....	..	24	8	1846

HANOVER AND Lighthouses. NETHERLANDS. 67

Year established.	Name and Character of Light.	Lat. N. Long. E. ° ,'	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
1858	Lühe Light Vessel	.....	In 10 feet. Fixed bright light	...	...	...	....
	Schulau Light Vessel	.....	In 2½ fathoms. Red light.....	...	...	...	....
1843	HELIGOLAND	54 10.8	(British). A circular white tower,	...	221	20	1811
1860	One fixed bright light	7 53.1	60 feet high, on W. side				
	HANOVER.						
	WESER RIVER.						
1852	WESER LIGHT VESSEL	53 49.	At entrance in 8 fms. Two Masts	..	30	3	1813
	One fixed bright lt.	8 8.3	and ball at the Fore				
	HOHE WEG FLAT.						
	One fixed bright lt.	53 42.8	In one tower. Lower lt. from N.	2a	112	15	1856
	One fixed red and br. light	8 14.9	by W. ¼ W., to E. by S.: it shows red to the Dwasgatt ..	44	7	1857	
1854	Bremerhaven	.....	Bright light at 10 feet at new Harb.	..	..	10	....
	One br., one red lt.		; red lt. on old Port Mole				
1852	Heppens	.....	A small light near new Harbour	..	..	..	....
1853	WANGEROOG	53 47.4	E. of Island; tower white, 60	..	100	12	1856
	One rev. br. lt., 2 min.	7 54.2	feet high; a beacon to E. by N.				
1805	BORKUM ISLAND	53 35.5	A red brick tower, 110 ft. high,	2a	142	18	1817
	One fixed bright light	6 40.4	at entrance of River Ems				
	EMS RIVER	53 20.3	On the Dyke of the Knock, at	6a	20	8	1836
	One fixed bright light	7 3.	entrance				

NETHERLANDS.

ZUIDER ZEE.

....	HARLINGEN	53 10.6	On Rampart.....	..	50	10	....
	One fixed bright lt.	5 25.					
1839	STAVOREN	53 25.2	N.W. of side of Harbour .....	..	39	10	....
	One fixed bright lt.	3 21.6					
1857	URK ISLAND	53 39.7	On the S. W. Point	4b	69	10	....
	One rev. br. lt. 2½ m.	5 35.8					
1814	SCHOKLAND ISLAND	53 37.2	On S. Point of the Island .....	..	34	8	....
1815	One fixed bright lt.	5 46.7					
1853	HOEK, now Amsterdam	53 22.3	At the angle of the River Y .....	..	51	10	....
	One fixed bright lt.	5 1.1					
1853	MARKEIN ISLAND	.....	One fixed br. lt. on S.E. Point..	..	52	10	....
	GELDERSCHIE HOEK	53 44.6	A stone tower on the Dyke .....	..	55	10	....
	One fixed bright lt.	5 17.2					
....	Wieringen	53 53.4	On W. of Id., N. and S., 448	..	39	6	....
	Two fixed bright lts.	4 56.3	yards apart	16	4		

There are also small Harbour lights in the IJssel Zee at Workum, Hindeloopen, De Lemme, Blokzyl, Genemuiden, Kampen, Elburg, Harderwyk, Nykerk, Muiden, Edam, Hoorn, Enkhuisen, Medemblik, &c.

Name and Character of Light.	Lat. N. Long. E. c.	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
SCHIERMONNIKOOG Two fixed bright lts.	53 28.8 6 10.	On the North side of the Id., S.E. by S., 1,102 yds. apart ..	15 | 147 | 15 | 1864	139		
TERSCHELLING One rev. br. lt., 1 min.	53 21.7 5 13.1	On the Brandaris tower, near the W. end of Island	2b | 177 | 20 | ....			
VLIELAND One fixed bright light	53 17.8 5 3.8	.....	.. | 151 | 12 | ....			
NIEUWE DIEP One fixed bright light	52 58. 4 47.	On the Weirhoofd, N.E., 61 yds. apart .....	.. | 29 | 8 | 1843			
		One fixed red light	.. | 35 | 8 | 1848			
KYKDUIN One fixed bright light	52 57.1 4 43.5	On the Fort on the high white Sandhill .....	.. | 161 | 20 | 1822			
HIJMOND-AAN-ZEE Two fixed bright lts.	52 37.1 4 37.6	On H. I. Z., 400 yds. apart. N. Lighthouse, called Van Speyck's Tower	8a | 120 | 16 | 1864	100	10	
Zandvoort One fixed light	52 22.5 4 31.5	N. of Village, a coal fire for fishermen .....	.. | 86 | 4 | ....			
Noordwijk-aan-Zee One fixed bright light	52 14.6 4 25.9	For fishermen. On a scaffold .....	.. | 68 | 5 | ....			
Katwijk-aan-Zee	.....	Light for fishing boats .....	.. | 82 | 6 | ....			
SCHEVENINGEN One fixed bright light	52 6.3 4 18.3	A stone tower, S. of town; half mile S.W. of Church	8a | 95 | 16 | 1860			
VOORNE ISLAND.						
Brielle Harbour	.....	Fixed bright light on H. Maes ..	.. | 10 | 4 | 1858			
Steenen Baak	.....	One fixed bright light .....	.. | .. | .. | ....		
Oostvoorne One br. and one red fixed light	51 54.8 4 4.5	Half mile W. of Village; S.E. $\frac{1}{2}$ S., 457 yards apart .....	.. | 69 | 7 | 8 | 1857			
HELLVOETSLOUIS One fixed bright lt.	51 49.2 4 7.9	W. end of Harbour .....	.. | 46 | 8 | 1858			
GOEREE ISLAND.						
Middelharnis	.....	Fixed bright Harbour light .....	.. | .. | .. | 1857			
GOEDEREDE or GOEREE One fixed light	51 49.1 3 58.8	On Church tower. Red towards E.N.E. to N.E. by E.	2a | 148 | 18 | 1856			
Kwaden Hoek	.....	One fixed bright light .....	.. | .. | .. | 1857			
Steenen Baak	.....	Red lt. to W., on N. side of Id. ..	.. | 98 | 10 | 1858			
SCHOUWEN ISLAND.						
Ossenhoek	.....	One fixed bright light .....	.. | 28 | 8 | 1859			
BROUWERS HAVN. Two fixed br. lights	51 44.5 3 47.5	At Renesse, on N. side of Id., E.S.E. $\frac{1}{2}$ E., 800 yards apart	3a | 148 | 16 | 1848			
			4a | 82 | 12 |			
Verklikker, or guide lt.	.....	N.W. of Id., to show Anchorage ..	.. | 55 | 6 | ....			

	Name and Character of Light.	Lat. N. Long. E. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
1854	SCHOUWEN One rev. bright lt.	51 42.5 3 41.8	A fine tower, 166 ft. high, on W. end of Id. Bright 25 secs. every 1½ min.....	1b	171	20	1744 1840
....	WALCHEREN ID.						
	See	.....	Light S. of Middelburg Harbour	..	33	3	....
1843	VEERE One fixed bright lt.	51 32.9 3 40.5	S. side of entrance	4a	38	10	1847
1849	WEST CAPPEL One fixed bright lt.	51 31.8 3 27.1	On old Church Tower	•	144	15	1818
1822	FLUSHING One fixed bright lt.	51 26.4 3 34.7	On Westhaven Bastion .....	..	49	10	....
1853	S. BEVELAND ID.						
	BORSELEEN	51 25. 3 44.	One fixed bright light	4a	35	9	1847
....	Batha	51 23.7 4 12.8	S.E. of Fort.....	..	32	5	....
5	Goes Harbour One fixed bright lt.	51 31.8 3 55.8	On N. side of entrance .....	..	31	5	....
6	TER NEUSE, AXEL ID. One fixed bright light	51 20.5 3 50.	On W. Jetty .....	..	43	10	1845
1850	THIOLEN ISLAND.						
1858	Gorishoek One fixed bright lt.	51 31.6 4 4.8	N. of Ferry .....	..	35	4	....
....	Stavemisse	.....	Bright lt. at E. Angle of Haven	..	27	5	....
1857	ZIERIKZEE Two fixed bright lights	51 37.9 3 55.4	One at S. Angle, near Zierikzee; the other on W. Haven Heads	..	31	4	....
1858	ZIJDE Two fixed bright lts.	51 39.3 4 6.3	One on Outer Dyke of Stooff Polder; the other on Land side of Dyke .....	..	31	5	....
1857	Ooltgensplaat One fixed bright light	51 40.9 4 22.2	End of Harbour Dam, River Volgerak .....	..	15	6	....
1856	WILLEMSTAD One fixed bright light	51 41.8 4 26.7	In front of Bastion.....	..	41	10	....
1857	Strijen-Sas One fixed bright light	51 42.7 4 35.6	W. Heads of Outer Haven ....	..	48	6	....
1858	DORDSCHE KIL One fixed bright light	51 43.4 4 37.5	W. extremity of Dordt Channel	..	48	10	....
1859	Krab	.....	In Old Maas. One bright light	..	31	2	....
1848	MAAS RIVER	.....	Small Harbour lights at Schie- dam, Pernis, and Vlaardingen	..	..	..	....
....							

Name and Character of Light.	Lat. N. Long. E. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
NORTH HINDER LT. VESSEL One fixed br. light	51 36.7 2 34.6	In 14 fathoms, on the E. side ...	• |	40 | 11 |	1858	
PAARDE MARKT LT. VES. One fixed red light	51 23.7 3 20.	S.W. part of Bank .....	• |	... | ... |	1849	
Heyst One fixed bright light	51 20. 3 14.	N. of Town .....	.. |	48 | 8 |	1842	
Blankenberg One fixed bright light	51 18.9 3 8.	In small Fort .....	.. |	44 | 6 |	1839	
OSTENDE One fixed bright lt.	51 14.4 2 55.9	Tower, 170 feet high, 820 yards | 1a | 189 | 20 | 1860 E. by N. of old light .....	.. |	40 | 7 |		
E. Pier	.....	Red light, while 8 to 14 ft., and bright lt., while 14 ft., on Bar	.. |	25 | 6 |	1849	
W. Pier	.....	Green light all night .....	.. |	25 | 7 |	....
Nieuport Tide Light One fixed bright light	51 8.4 2 43.	E. side of Port, from half flood to half ebb	32 6	1825	

FRANCE.

LIGHTHOUSES.

North Coast.

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Year established.	Name and Character of Light.	Lat. N. Long. E. ° °	Description, &c.	Description of Apparatus		Height above H. W.	Visible in Miles.	Year established.	
				Height	Visible in Miles.				
1858	DUNKERQUE One rev. br. lt. 1 min.	51 3. 2 22.	Brick tower, 180 ft. high, on Pier Head	1b	194	24	....	....
1840	DUNKERQUE PORT One bright and one red fixed light	.....	Bright lt. on Heuguenar Tower; red light on W. Mole Head ..	5a ●	85 23	9 3	1845	....
1842	GRAVELINES Three fixed br. lights	51 0.3 2 6.5	One lt. on Fort Philippe; 2 lts., 65 yds. apart, on S.W. Mole of Fort Philippe	3a ●	95 20	15 6	1843 1854	....
1839	WALDE POINT One fixed and flash. lt.	50 59.7 1 55.1	Br. lt., with red flash every 20 secs.; no eclipse .....	..	34	10	1859	....
1860	CALAIS One fixed and flash. lt.	50 57.7 1 51.1	Fixed lt., with flash every 4 min.; in tower, 167 ft. high, on Old Fortifications	1d	190	20	1848	....
1849	CALAIS HARBOUR Two lts. and one Tide lt.	.....	Red lt. on W. Jetty; green lt., in fair weather, on E. Jetty; and br. tide light on Fort Rouge while 8 feet	● 6a	16 33	2 9	1842	....
1825	CAPE GRISNEZ One rev. br. lt., $\frac{1}{2}$ min.	50 52.2 1 35.1	Tower, 46 feet high, $\frac{1}{2}$ mile S. of Cape. Eclipses not total at 12m.	1b	194	22	1842	....
<i>Boulogne</i>									
	Two fixed bright lts., and one fixed red lt.	50 43.9 1 35.1	Two br. lts. in one tower; higher lt. while $9\frac{1}{2}$ ft.: lower lt., from high water to 9 ft. ebb. Red lt. on N.E. Jetty while $9\frac{1}{2}$ feet ..	6a ●	43 33 46	9	1835	....
	ALPRECK POINT One fixed and flash. lt.	50 41.9 1 33.7	A br. lt., with red flash every 2 min. Tower, 33 ft. high, $2\frac{1}{2}$ miles S.W. of Boulogne	4d	161	12	1842	....
	ÉTAPLES or CANCHE RIVER Two fixed br. lts.	50 31.4 1 35.5	At Touquet, S. side of Mouth of River, in towers 171 ft. high, N.N.E. and S.S.W., 273 yards apart	1a	174	20	1852	....
	Lornel Point	.....	One fixed lt. on N. side of Mouth	●	52	6	....	....
	PT. HAUT-BANG OF BERCK One fixed bright light	50 24. 1 33.5	N. side of Mouth of l'Authie River	4a	66	10	1836	....
<i>SOMME RIVER.</i>									
	<i>Crotoy</i> One fixed, bright lt.	50 12.9 1 37.3	On N. side of entrance. Tide light while 3 feet	●	..	4	1851	....
	<i>Hourdel Point</i> One fixed bright lt.	50 12.9 1 33.9	On S. side of entrance. Tide light while 2 feet	●	..	4	1852	....
	<i>CAYEUX</i> One fixed and flash. lt.	50 11.7 1 30.7	On S. side of entrance. Fixed light, with flash every 4 min.	3d	92	15	1835	....
	<i>Cayeux</i> One fixed bright lt.	.....	812 yards S.W. of Cayeux light, from $3\frac{1}{2}$ hours flood to $1\frac{1}{2}$ ebb.	●	..	..	1856	....
	<i>Treport</i> One fixed bright light	50 3.9 1 22.1	Tide light on W. Mole, while $6\frac{1}{2}$ feet in the Channel	5a	36	10	....	....

Name and Character of Light.	Lat. N. Long. E. ° °	Description, &c.	Descript on of Apparatus	Height above H. W.	Visible in Miles.	Year established
<i>Dieppe, W. Mole</i> One fixed bright lt.	49 36. 1 5.2	Tide light while 10½ feet .....	..	39	10	....
<i>E. Mole</i> Three fixed br. lts.	.....	On a Mast. Lowest lt. all night; highest light from 2½ hours before to 2 hours after high water; middle lt. from 2 hours before until high water	●	23 31 27	4....	....
AILLY POINT One rev. br. lt. 1 min.	49 55.1 0 57.5	Tower, 66 ft. high, on the Point. Eclipse not total at 10 miles	1b	305	27	....
ST. VALERY-EN-CAUX One br. 1 red fixed lt.	49 52.1 0 42.7	Bright tide light on W. Jetty while 8½ feet. Red lt. on E. Jetty	● ..	29 24	6 3	1857 1857
FÉCAMP One fixed bright light	49 46.1 0 22.3	On Fagnet Point, above the chalk cliff. Sometimes obscured by fog	1a	426	18	1836
Fécamp Harbour	.....	Fixed and flash. Red tide light on N. Jetty while 10 ft. Fixed red light on S. end of Jetty	5a	39 29	10 3	....

RIVER SEINE.

LA HÈVE Two fixed bright lts.	49 30.7 0 4.3	Two towers, 66 ft. high, on the Cape, S.W. & S., 69 yds. apart	1a	397	20	....
HAVRE One fixed bright lt.	49 29. 0 6.3	On N.W. Jetty. An Orange lt. also on S.E. Pier, vis. 1 mile; and a Lantern, with coloured glasses, on the Quay	5a	39	10	1843
HOC One fixed bright lt.	49 28.8 0 11.2	On Point, N. Bank of River Seine	5a	39	10	....
Hode Point	.....	One bright light on the Point ..	●	..	8	1847
Tancarville	.....	One bright light on the Point ..	●	..	8	1847
Villequier	.....	One br. lt. 1 m. W. of Vatteville Church	●	..	3	....
Caudebecquet	.....	One br. lt. ½ m. E. of Caudebec Church	●	..	3	....
Neuville	.....	One br. lt. 1½ m. below Vatteville Church	●	..	3	....
Vaquerie	.....	One br. lt. 1½ m. above Aizier Church	●	..	3	....
Aizier	.....	One bright lt. near the Church ..	●	..	4	....
Courval	.....	One br. lt. 2½ m. above Quilleboeuf light	●	..	3	....
Gros-Heurt	.....	One br. light ½ m. above Point Quilleboeuf	●	..	3	....
QUILLEBOEUF One fixed bright lt.	49 28.4 0 31.6	N. end of Quay, S. Bank	5a	33	10	....
La Roque	.....	One bright light on the Point ..	●	..	8	....
Berville	.....	One bright light N. of Church ..	●	..	8	....

	Name and Character of Light.	Lat. N. Long. E. Long. W. ○	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
10 | ....	FATOUVILLE One fixed and flash. light	49 24.9 ○ 19.4	Tower, 105 feet high, on the Heights. Br. light, with red flash, every 3 minutes	1d	420	20	1850
1 | ....	HONFLEUR Two fixed br. lights	49 25.5 ○ 13.6	On Hospital Jetty, N.W. end of Tower; and Tide light on E. Jetty, while 6 <i>1/2</i> feet	3a 5a	82 29	15 6	1857 1843
7 | ....	TOUQUES RIVER Two fixed bright lights	49 21.7 ○ 4.5	W. side, 153 yds. apart. Lower lt. while 7 feet on Bar. In one lead in	● ●	33 20	6 6	....
6 | 1857 3 | 1857 18 | 1836	L'ORNE RIVER Two fixed bright lts. One fixed red light	Long. W. 49 16.6 ○ 15.6	Br. lts. on Church and Redoubt of Oystreham, W. side of entr. Red Tide lt. on N. end of W. Jetty, 3 hours before and after high water	5a ● ●	92 39 ..	10 4 2	.... 1855
10 | .... 3 | ....	Courseulles One fixed bright light	49 20.3 ○ 27.5	On W. Jetty Head	●	30	6	1857
20 | ....	POINTE DE VER One fixed and flash. lt.	49 20.5 ○ 31.2	800 yards from the shore. Fixed light, with flash every 4 min.	3d	138	15	....
10 | 1843	PORT-EN-BESSIN Two fixed bright lights	49 21.1 ○ 45.6	N.E. by E. and S.W. by W., 79 yards apart. High tide lt. while 12 feet on Bar	5a 5a	131 92	8 6	1854
10 | ....	Grandcamp One fixed bright light	49 23.4 1 2.6	875 yards West of Church	●	26	3	1836
8 | 1847	PORT D'ISIGNY Two fixed bright lights	49 19.3 1 8.7	N. by E. $\frac{1}{2}$ E. and S. by W. $\frac{1}{2}$ W., 306 yards apart	5a	46 23	10 8	1852
8 | 1847	ST. MARCOUP One fixed bright light	49 29.9 1 8.9	On the Fort, E. of Sand-fly Island	5a	56	10	1846
3 | ....	MORSALINE One fixed bright light	49 34.3 1 19.4	On the Mound. Much higher than La Hougue light	5a	282	10	1836
3 | ....	LA HOUGUE One fixed bright light	49 34.3 1 16.4	At S. end of Fort	5a	36	10	1836
3 | ....	SAIRE POINT One fixed bright light	49 36.4 1 13.9	On Reville Redoubt	5a	36	10	1836
3 | ....	BARFLEUR One rev. br. lt. $\frac{1}{2}$ m., & Two fixed bright lts.	49 41.9 1 16.	Rev. lt. on the Cape. Bright lts. on S. side of entrance, S.W. by W. $\frac{1}{2}$ W., and N.E. by E. $\frac{1}{2}$ E., 309 yards apart	1b 6a 6a	236 23 43	22 8 9	1836
4 | ....	LEVI CAPE One fixed and flash. lt.	49 41.8 1 28.5	Tower, 103 feet high. Lt. br., with red flash every 3 min. ..	4d	115	12	1858
3 | ....	CHERBOURG Port de Commerce	.....	Red light on E. Jetty	4a	33	3	1838
10 | ....	PELÉE ISLAND One fixed bright lt.	49 40.3 1 34.9	On Fort Impérial	5a	85	10	....
8 | ....	LA DIGUE One fixed & flash. lt. One fixed green light One red light	49 40.1 1 37.2	Bright fixed, with flash every 3 min., on Central Fort. Green light on Eastern Head. Temporary red light on W. Head	6d ● ●	66 .. 39	10 2 10	1839 1853 1853

Name and Character of Light.	Lat. N. Long. W. ○ /	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
QUERQUEVILLE FORT One fixed bright lt.	49 40.3 1 49.1	On the Guard-house	5a	59 | 10		....
CAPE DE LA HAGUE One fixed bright light	49 43.4 1 57.3	On the top of Gros du Raz Rock, half mile from Cape	1a	157 | 18	1837	
CASKETS Three rev. br. lights, 20 seco.	49 43.4 2 22.5	(British). Placed triangularly on the highest Rock, E. $\frac{1}{4}$ N., 62 yards; S.W. $\frac{1}{4}$ W., 46 yards; and N.W. $\frac{3}{4}$ W., 24 yds. apart	● | ..	113 | 15	1723	
HANOIS or HANO- VEAUX ROCKS One light building	49 25.8 2 43.3	(British). Building .....	..	.. | ..	1861	
GUERNSEY One fixed bright light	49 27. 2 33.	(British). On St. Pierre, S. Pier Head .....	● | ..	40 | 11	1832	
JERSEY						
VERCLUT BREAKWATER One fixed bright lt.	49 13. 2 1.2	(British). On the Outer end, in St. Catherine's Bay	5a	60 | 11	1857	
ST. HELIER One fixed bright lt.; One fixed red lt.; and One fixed blue light	49 10.5 2 7.3	Bright light on Victoria or S. Pier; red light on Albert or N. Pier; blue light on Old N. Pier.....	● | ● | ..	31 | 15 | 17	1858 | 1859 | 1858	
Gouray Pier Head	.....	One fixed bright light .....	..	.. | ..	1857	
Dielette One fixed br. and red lt.	49 33.1 1 51.7	On Jetty Head. Red lt. at head of Harbour. N.W. and S.E., 169 yards apart .....	..	23 | 75 | 9	1858	
CAPE CARTERET One rev. br. lt., $\frac{1}{2}$ min.	49 22.4 1 48.5	Tower, 49 feet high, on Cape ..	2b	262 | 18	....
Portbail Two fixed red lights	49 20. 1 43.	On Church Tower and Point Dune, S.W. $\frac{1}{2}$ S., 953 yds. apart	..	.. | ..	1859	
Sénéquet	49 5.5 1 39.8	Building, 1861 .....	..	.. | ..	....
RÉGNEVILLE One fixed bright light	49 0.5 1 34.9	On Agon Point	5a	33 | 10	1856	
CHAUSEY ISLANDS One fixed and flash. lt.	48 52.2 1 49.4	On S.E. Point. A br. lt., with red flash every 4 min.....	3d	121 | 15	1847	
GRANVILLE One fixed bright lt.; & One fixed red light	48 50.1 1 36.9	Bright lt. on Granville Rock, or Cape Lihou. Red lt. on Mole Head, W. side of entrance ..	3a	154 | 15 | 26 | 3	1839 | ....	
ST. MALO. One fixed bright light	48 39. 2 1.7	On the new Mole des Noires ..	5a	33 | 10	1842	
CAPE FREHEL One rev. br. lt., $\frac{1}{2}$ min.	48 41.1 2 19.2	Tower, 72 feet high, on the Cape	1b	259 | 22	....
LÉGUE PORT One fixed bright light	48 32.2 2 43.2	On Point Aigle	5a	49 | 10	1857	
ILES SAINT QUAY One fixed bright light	48 40. 2 48.6	On Harbour Island	5a	49 | 10	1850	

FRANCE

LIGHTHOUSES.

North Coast. 75

Miles. Year established.	Name and Character of Light.	Lat. N. Long. W. ° °	Description, &c.	Description of Apparatus	Height above H. W. in Miles.	Year established.
10 | ....	BINIC PORT One fixed bright light	48 36.1 2 49.	On Penthiévre Mole	5a	36 | 10 | 1854	
18 | 1837	Portrieux One fixed red light	48 38.8 2 49.5	On end of Pier	●	29 | 3 | 1853	
15 | 1723 .. | 1855	BRÉHAT ISLE Two fixed red lights	48 51.9 2 59.3	On Paon Rock and Rosedo Hill, W. $\frac{1}{4}$ S., and E. $\frac{1}{4}$ N., $\frac{1}{4}$ mile apart	5a	67 | 90 | 6 | 8 | 1860	
.. | 1861	HÉAUX DE BRÉHAT One fixed bright light	48 54.5 3 5.3	N.E. side of Rocks	1a	148 | 18 | 1835	
11 | 1832	SEPT ILES One fixed and flash. lt.	48 52.7 3 29.5	Tower, 52 feet high, on E. end of Ile aux Moines. Fixed, with flash every 3 min.	3d	184 | 15 | 1835	
11 | 1857	TRÉGUIER RIVER One fixed red lt., and One fixed bright light	.....	Proposed (1861). Red lt. on Mill of St. Antoine, and br. lt. on Harbour Mill .....	..	.. | .. | .. | ....
6 | 1858	PERROS BAY Nantouar Bridge	48 48.1	On S.E. shore of Bay .....	..	33 | 10 | 1860	
3 | 1859	One fixed bright lt.	3 23.9				
3 | 1858	Kerjean	.....	Fixed br. light, 750 yds. S.E. of Nantouar Light .....	..	263 | 14 | 1860	
.. | 1857	Pigeon House	.....	Bright light on S. shore of Bay	..	89 | 12 | 1860	
5 | 1858	Kerpigrent One fixed bright lt.	48 46.7 3 28.4	Near the Mill, 3,133 yards S.W. of Pigeon House Light .....	..	259 | 14 | 1860	
18 | ....	Ploumanac'h Port One fixed red light	48 50.3 3 29.1	On the Point .....	..	69 | 5 | 1860	
.. | 1859	MORLAIX					
	ILE NOIRE One fixed & flash. lt.	48 40.4 3 52.6	Fixed light, with flash every 2 minutes	5d	46 | 10 | ....	
.. | ....	TOUR LA LANDE One fixed bright lt.	48 38.2 3 53.2	(There is also a small red lt. on the Château du Taureau for the anchorage.)	5a	285 | 12 | ....	
10 | 1856	Jardin or Louet Id.	.....	One fixed light building, 1861 ..	..	.. | .. | .. | ....
15 | 1847	ILE DE BAS One rev. br. lt., 1 min.	48 44.7 4 1.7	Tower, 131 feet high, on W. part	1b	233 | 24 | 1836	
15 | 1839 3 | ....	ILE VIERGE One fixed and flash. lt.	48 38.4 4 34.2	On E. Point. Br. fixed lt., with red flash every 4 min.	3d	108 | 15 | 1845	
10 | 1842	ABERVRAC'H 1. One bright and 1 green light; also 2. One red and 1 br. light	48 35.7 4 33.5	1. Br. lt. at Head of St. Antoine Creek, and green lt. on E. of Palue Beach. 2. Red lt. on Plouguerneau Steeple, and br. lt. on Ile Vrac'h, E. side of entrance	●	49 | 4 | 1845	
22 | ....				●	29 | 3 | 1845	
0 | 1857	OUESSANT, or USHANT One fixed bright lt.	48 28.5 5 3.5	N.E. Point of Id. A second lt. on S.W. Point is proposed (1861)	1a	272 | 18 | ....	
0 | 1850	CONQUET PORT One fixed bright light	48 21.7 4 47.5	On Kermorvan Point	4a	72 | 12 | 1849	

Name and Character of Light.	Lat. N. Long. W. ° ,'	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
ST. MATHIEU One rev. br. It. $\frac{1}{2}$ min.	48 19.8 4 46.4	Tower, 82 feet high on the Point	2b	177	18	1835
BREST						
MINOU POINT One fixed bright It.	48 20.2 4 37.	Tower, 79 feet high, on the Point	3a	105	15	....
PORTZIC POINT One fixed and flash light	48 21.5 4 32.2	Tower, 108 feet high, 4 miles E. $\frac{1}{2}$ S. of Minou Light. Flash every 3 min.	2d	184	18	....
Camaret Bay	.....	Light building (1861) on E. Co.	...	...	...	....
TOULINGUET POINT One fixed red light.	48 16.8 4 37.9	S.W. side of entrance	4a	161	10	1849
DOUARNENEZ BAY One fixed bright light	48 6.2 4 21.5	On Tristan Ile	4a	114	10	1857
ILE DE SEIN One fixed and flash It.	48 2.7 4 52.	N. Point of Id. Fixed It., with flash every 4 min.	1d	148	20	1846
BEC DU RAZ One fixed bright light	48 3.4 4 44.	Tower, 49 feet high on the highest part	1a	259	18	1843
Audierne Port One fixed red It., and One fixed bright light	48 0.6 4 32.5	Red It. on Raoulic Point; br. It. near Capuchin Garden; N.E. $\frac{1}{2}$ N., and S.W. $\frac{1}{2}$ S., 1,203 yards apart	5a	89	5	1856
PENMAR'C'H POINT One rev. br. It. 1 min.	47 47.9 4 22.4	On the Point, on the Church of St. Pierre	1b	135	22	....
Loc-tudy	.....	Building (1861) on Pont l'Abbé .....	...	...	...	....
ODET RIVER One fixed red light, and One bright light	47 52.3 4 6.8	On Coq Point, N. $\frac{3}{4}$ E., and S. $\frac{1}{4}$ W., 291 yds. apart. In one lead in	●	33	7	1848
PENFRET One fixed and flash. It.	47 43.3 3 57.3	N. Point of Id. Fixed It., with flash every 4 min.	3d	118	15	1838
CONCARNEAU Two fixed bright lights	47 52.2 3 55.2	On Croix Battery, and between Concarneau and Beuzec, in one, N.E. $\frac{1}{2}$ E., 2,052 yds. apart	6a	46	9	1849
Lanriec	.....	Red It. on E. of Concarneau Port	●	135	9	1857
Douelan Port	.....	Two Its. building E. & W. of entr.	...	...	...	1861
ILE DE GROIX One fixed br. It., and One fixed and flash. It.	47 38.9 3 30.7	Fixed It. on N.W. part; the other on Fort, on E. part. Br. It., with red flash every 3 min. ...	1a	194	18	....
L'ORIENT 1. Two fixed br. lights 2. Two fixed br. lights	47 44.9 3 20.8	1. One It. on Church Tower, the other at Lapeyrière, N. 83° E., 1,826 yards apart. 2. Two Its. in Port Louis, E. side, E. $\frac{1}{2}$ N., and W. $\frac{1}{2}$ S., 481 yards apart	6a	62	12	1850
Etel River One fixed red light	47 38.7 3 12.9	At entrance of River	6a	20	8	1850
				39	10	1854
				62	12	1854
					

FRANCE.

LIGHTHOUSES.

West Coast.

	Name and Character of Light.	Lat. N. Long. W. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
18 | 1835	BELLE ILE Sauzon Port One fixed red light	47 22.4 3 13.2	On the end of Mole	4a	28	..	1859
15 | ....	Palais Port One fixed br. light	47 20.9 3 9.3	Mole Head, S. side of entrance	6a	30	9	1836
18 | ....	GOULFAR BAY One rev. br. lt., 1 m.	47 18.7 3 13.5	Tower, 151 feet high, on S.W. of Island	1b	276	27	1836
.. | ....	HEDIC ID. One fixed bright light	47 20.5 2 52.	Tower, 39 feet high, 600 yds. W. from E. Point of Island	6a	85	10	1836
10 | 1840	QUIBERON BAY LA TRIGNOUSE	47 27.4 3 2.8	On the Rock, S.E. of Quiberon Peninsula. Fixed light, with flash every 3 min.	4d	59	12	....
10 | 1857	One fixed and flash. light						
20 | 1840	Haliguen One fixed bright lt.	47 29.2 3 5.9	Tower, on N. Jetty	4a	40	9	1856
18 | 1843	La Crac'h One red and 1 br. lt.	47 34.1 3 0.4	On left Bank of River, N. by E. and S. by W., 574 yds. apart	6a	29 69	9	1856
5 | 1866	Navalo Port One fixed bright lt.	47 32.9 2 54.	On the S. Point of entrance to Morbihan	5a	72	10	1840
12 | ....	Penlan Point One fixed bright light	47 31. 2 30.2	On the Point	5a	52	10	....
22 | ....	LE FOUR One rev. br. lt., $\frac{1}{2}$ min.	47 17.9 2 37.9	A round stone Tower on the Rock	2b	79	18	1822
.. | ....	Croisic Port Two fixed bright lts.	47 18. 2 30.9	Near the Church, N. and S., 50 yards apart	6a	13 33	6	1838
7 | 1848	LOIRE RIVER Point l'Eve	47 14.5 2 16.1	Marks the channel to the town of St. Martin.	6a	102	6	1856
5 | 1838	One fixed red light						
9 | 1849	AIGUILLOUN TOWER	.....	One fixed bright light	3a	112	12	....
2 | 1857	COMMERCE TOWER	.....	One fixed and flash. lt., flash 2 m.	3d	128	14	....
1861	St. Nazaire	.....	One fixed br. light, on Mole Head	6a	26	8	1836
1857	Paimboeuf Port One fixed bright lt.	47 17.4 2 2.	End of Mole	6a	26	8	1856
1861	Pierre à l'Oeil	.....	One fixed light proposed (1861). .....	..	..	..	....
....	St. Nicholas I.	.....	Red light proposed (1861). ....	..	..	..	....
1850	Mindine Tower	.....	One fixed light proposed (1861). .....	..	..	..	....
1850	Pornic Port One fixed bright light	47 6.6 2 7.	On Noveillard Point	6a	59	9	1846
1854							
1859	PILIER ID. One fixed and flash. lt.	47 2.6 2 21.7	On N.W. Point. Flash every 4 min.	2d	105	18	....
1859	ILE D'YEU, near N. Point, One fixed bright lt.	46 43.1 2 23.	Tower, 108 feet high, on Mound. From N. Point 1,860 yards ..	1a	177	18	....

Name and Character of Light.	Lat. N. Long. W.	Description, &c.	Description of Instru- ment	Height above H. W.	Visible in Miles.	Year establishtd.
BRETON PONT Three fixed br. lts.	46 43.6 2 21.	One on Outer Jetty, N. side of entrance; one (proposed, 1861) on Point Corbeaux; and one at Head of Harbour	6a .. 5a	23 .. 49	8 .. 10	.... 1860
St. Gilles-sur-Vie One fixed red light	46 41.6 1 56.9	N. side of Jetty	5a	39	6	1852
LA CHAUME One fixed bright light	46 29.7 1 47.4	Tower, 85 feet high, on W. side of entrance to Olonne.....	4a	118	12	....
Sables d'Olonne	.....	Fixed br. lt., E. side of entrance	5a	23	8	....
BARGES D'OLONNE	.....	Flashing light, building (1861).	..	..	..	....
Roche Bonne Lt. Vessel	.....	Proposed (1861). ....	..	..	..	....
PERTUIS BRETON						
GROUIN DU COU POINT One fixed bright lt.	46 20.8 1 28.3	N., 32° E., 7 miles from the Tour des Balcines	5a	59	10	....
AIGUILLOU POINT One fixed bright lt.	46 16.3 1 12.8	Bearing S. by E., leads on to Mid. Channel	5a	33	10	....
ILE DE RÉ						
BALEJNES One rev. br. lt., $\frac{1}{2}$ m.	46 14.7 1 33.8	On N.W. Point. Flashes of unequal brilliancy	1b	164	22	1854
HAUT-BANC DU NORD One fixed br. lt.	46 15.8 1 35.20	On the Shoal	3a	72	15	1854
St. Martin Port One fixed bright lt.	46 12.4 1 21.9	On Demi-Bastion, E. of entrance	5a	52	6	....
Port de la Flotte One fixed bright lt.	46 11.3 1 19.4	On the Mole	6a	30	9	1849
CHAUVEAU POINT One fixed bright lt.	46 8. 1 16.5	S.E. Point of Island	5a	72	14	1842
Rochelle Harbour One bright and one red fixed light	46 9.4 1 9.3	Upper br. lt. on E. Quay; lower lt. red, W. $\frac{1}{2}$ S., and E. $\frac{1}{2}$ N., 257 yards apart	5a 6a	59 46	10 8	1852
ILE D'AIX	46 0.6 1 10.8	On Fort at S. Point of Island ..	5a	56	10	....
One fixed bright light						
ILE D'OLÉRON						
CHASSIRON One fixed bright lt.	46 2.8 1 24.7	Tower, 141 feet high, N.W. Point of Island	1a	141	18	1836
La Pérotine One fixed bright lt.	45 58.2 1 13.9	End of Jetty .....	..	38	4	1859
Château Port Two fixed br. lts.	45 53. 1 11.2	Building, 1861. When in one will lead in .....	..	..	..	....
RIVER GIRONDE						
CORDOUAN One rev. br. lt., 1 m.	45 35.2 1 10.5	A handsome structure on the Rock	1b	207	27	1727

FRANCE.

LIGHTHOUSES.

West Coast. 79

	Name and Character of Light.	Lat. N. Long. W. o /	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
RIVER GIRONDE							
1860	COUBRE POINT One fixed bright lt.	45 41.5 I 15.4	Tower, 100 feet high, on N. point of River, N. point of entrance	3a	121	5	1860
1852	FALAISE AND TERRE NEGRE One red & 1 br. lt.	45 38.9 I 6.9	Red light at Falaise, 600 yards from bright light on Terre Nègre Tower	5a 4a	46 118	7 14	1852 1842
....	Pontaillac One rev. red and br. light	45 38.2 I 3.7	Wooden Tower, 105 ft. high, on the Table land. Red and white alternately, for 20 secs.....	3b	177	15	1856
....	Royan	.....	Bright light on Jetty.....	•	36	6	....
....	St. George One fixed red light	45 36. I 0.6	On East bank of River .....	..	44	7	1860
....	SUZAC One fixed red light	45 35.4 I 58.9	On the Sandhills at Suzac on East bank.....	..	121	12	1860
....	DE GRAVE One fixed bright lt.	45 34.3 I 3.4	On the Point	4	85	15	1828 1860
1854	TALLAIS BANK LIGHT VESSEL	45 30.7 I 59.1	One fixed bright light, in four fathoms, on W. side	5a	33	9	1845
1854	Tour de By Lt. Vessel One fixed bright lt.	45 27.6 I 45.3	On West Bank of River	5a	33	10	1860
1854	Mapon Light vessel	45 17.6 I 45.9	On West Bank of River	5a	33	10	1860
....	Ile de Patiras One fixed bright lt.	45 12.4 I 42.	On the North part of the Island	..	43	12	1860
1849	Trompeloup	.....	Fixed lt., on old Chapel, on W. Bank .....	..	..	15	1860
1842	Richard	.....	Fixed red lt., on W. side of River	4a	56	8	1845
1852	Gaet	.....	Fixed red light.....	..	..	..	....
....	Pauillac	45 11.9 I 44.9	Two small lts, on landing-place	..	..	..	....
....	Blaye	.....	E. side of River. Light at land- ing-place .....	..	..	..	....
....	Hourtin	.....	Two lights, proposed (1861) ....	..	..	..	....
1836	ARCACHON BASIN One fixed bright light	44 38.7 I 15.1	On Ferret Cape, N. side of en- trance	1a	167	18	1840
1859	CONTIS One rev. red and br. lt.	44 4. I 20.	Proposed (1861).....	..	..	..	....
....	ADOUR RIVER One fixed bright light	43 31.8 I 31.5	On Jetty, S. side of entrance ..	..	38	6	1863
1727 1854	BIARRITZ One rev. br. lt. $\frac{1}{2}$ min.	43 29.6 I 33.6	Tower, 144 feet high, on Point St. Martin	1b	240	22	....
....	SOCOA PORT One fixed bright light	43 23.7 I 41.1	W. Point of St. Jean de Luz Bay	5a	115	10	....

Name and Character of Light.	Lat. N. Long. W. o ,	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
FUENTERRABIA One fixed bright light	43 23.6 1 47.7	On Cape la Higuera, W. side of Bidasoa River	5a | 285	7 | 1855		
PASAGES PORT One fixed bright light	43 20.3 1 56.5	Cape la Plata, near W. entrance	4a | 486	14 | 1855		
SAN SEBASTIAN One fixed and flash. lt.	43 19.4 2 0.4	Mount Igueldo, W. side. Flash every 2 min.....	3d | 431	15 | 1855		
MACHICHACO CAPE One fixed and flash. lt.	43 28. 2 49.4	Bright fixed light, with flash every 4 min.....	1d | 260	18 | 1852		
BILBAO One fixed bright light	43 22.6 3 4.	Fort, on Point Galea, W. side of entrance	4a | 380	10 | 1852		
SANTONA	43 27.5 3 16.7	Building (1861) .....	... | ... | ...		
CASTRO URDIALES One fixed and flash. lt.	43 24.2 3 16.1	On Castle. Bright light, with red flash every 3 min.....	5d | 131	7 | 1853		
SANTANDER						
MOURO ISLAND		One fixed bright light	5a | 141	12 | 1860		
CAPE MAYOR One rev. br. lt., 1 min.	43 30.3 3 47.1	1½ miles from Port entrance....	2b | 298	24 | 1839		
Llanes	43 27. 4 39.	Light building (1861) .....	... | ... | ...		
RIVADESELLA	43 31. 5 o.	Building (1861)	3a | ... | ...			
GIJON	43 35.3 5 38.	Near Sta. Catalina Hermitage ..	4a | 167	10 | 1855		
PENAS CAPE One rev. br. lt. ½ min.	43 42.3 5 49.8	On the Cape.....	1b | 338	21 | 1853		
AVILES	43 38. 5 50.7	Building (1861) .....	... | ... | ...		
CUDILLERO One fixed bright light	43 36.2 6 9.1	Revallera Point	5a | 94	10 | 1858		
CAPE BUSTO One fixed and flash lt.	43 36.2 6 28.8	Bright, with red flash every 2 min.	3d | 307	12 | 1855		
ORRIO DE TAPIA ID. One fixed and flash. lt.	43 35.6 6 58.4	Fixed, with flash every 2 min...	3d | 93	15 | 1859		
PANCHA ISLAND One fixed bright light	43 34.7 7 4.2	Near Ribadeo	5a | 79	9 | 1859		
CAPE ESTACA One rev. br. lt., 1 min.	43 47.5 7 33.4	.....	1b | 307	20 | 1850		
CAPE PRIOR One fixed bright light	43 33.7 8 19.9	On N. part of the Cape	3a | 448	15 | 1854		
CAPE PRIORINO One fixed and flash. lt.	43 27.8 8 20.5	Bright fixed, with red flash every 2 min.	4d | 92	11 | 1854		
CORUNNA One fixed and flash. lt.	43 23. 8 24.1	On Tower of Hercules. Fixed, with flash every 3 min.	3d | 331	13 | 1847		

Visible in Miles.	Year established.	Name and Character of Light.	Lat. N. Long. W. ° ,'	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
7 | 1855		CORUNNA, St. ANTONIO CAS.	.....	Fixed light, building (1861)	6a	.. | .. | ..	.....
14 | 1855		CISARGAS ISLANDS	43 21.8 8 50.2	On Isla Mayor, N. Peak. Fixed One fixed and flash. Lt.	4d	358 | 11	1853	
15 | 1855		CAPE VILLANOS	43 9.8 9 12.9	Camarinas	4a	225 | 10	1854	
18 | 1852		CAPE FINISTERRE	42 52.6 9 15.4	S. Point of the Cape	1b	468 | 20	1853	
10 | 1862		CAPE CÉ	42 54.8 9 10.1	Octagonal Tower, 25 feet high, One red fixed light	5a	82 | 8	1860	
... | ...		CAPE CORROBEDO	42 34.6 9 4.8	On the Cape	3a	103 | 12	1853	
7 | 1853		SALVORA ISLAND	42 27.8 9 0.4	S. Point. Bright, with red flash One fixed and flash lt.	4d	82 | 10	1853	
12 | 1860		AROSA ISLAND	42 34.1 8 52.	On the N.W., or Caballo Point One fixed bright light	4a	38 | 18	1851	
24 | 1839		BAYONA or CIES ID.	42 12.4 8 54.1	Mount Faro, Middle Island	2b	595 | 20	1853	
... | ...		VIGO	42 15.1 8 41.	On Castle of La Guia, 1½ m. N.E. One fixed and flash. Lt.	4d	102 | 10	1844	

PORTUGAL.

10 | 1855	Pavoa de Varzim	.....	Fishing lts., 15 m. N. of Oporto	.. | .. | ..	1857
21 | 1853	OPORTO	41 9.1 8 37.2	At Nossa Senhora da Luz. (Bad One rev. br. lt., 6 min. light.) .....	● | 220 | 20	1834
... | ...	CAPE MONDEGO	40 12. 8 55.2	.....	● | 330 | 20	1837
10 | 1858	BERLENGAS	39 25. 9 31.2	Square tower, 100 feet high, on One rev. br. lt., 3 min. Great Berlenga Island .....	● | 365 | 25	1848
12 | 1866	CAPE CARVOEIRO	39 21.1 9 24.3	Tower, 94 feet high, on highest One fixed bright light part .....	● | 182 | 15	1790
15 | 1859	CAPE ROCA	38 46.5 9 30.	Light red and white alternately. One rev. br. and red Round tower, 52 ft. high, $\frac{1}{4}$ light, 1½ min. mile N.E. of Cape .....	● | 598 | 21	1772
9 | 1859	RIVER TAGUS				
20 | 1850	GUIA	38 41. 9 27.2	Square tower, 96 feet high, at One fixed bright lt. Nossa Senhora da Guia.....	● | 207 | 12	1771
15 | 1854	SAN JULIAN	38 39.7 9 20.	Square tower, 120 feet high, in One fixed bright lt. the Fort .....	● | 128 | 12	1848
11 | 1854	BUGIO	38 39. 9 18.1	Tower of Lorenzo, 70 feet high One rev. br. lt., 1½ m.	● | 110 | 16	1775
12 | 1847	Belem	38 40.8 9 17.6	In Fort, near Castle .....	● | 38 | 6	1847
	CAPE ESPICHEL	38 24.9 9 13.	Square tower, 100 feet high, on One fixed bright light the Cape	1a | 627 | 25	1848

Name and Character of Light.	Lat. N. Long. W. ° °	Description, &c.	Declination of Aries.	Height above H. W.	Visible in Miles.	Year established.
Setuval, or St. Ubes One fixed bright light	38 31.8 8 53.	On Fort, at W. entrance of Harbour	●	490	6	1775
CAPE ST. VINCENT One rev. br. lt., 2 min.	37 3. 9 0.	On the Convent	●	220	20	1846
CAPE SANTA MARIA One fixed bright light	36 56. 7 46.	On the Cape	●	109	15	1850

SPAIN.

			South Coast.
GUADIANA RIVER Four fixed lights	37 11. 7 18.	Building, 1861, at Ayamonte. Two lts. at River Mouth; and two on Christians or Higuerita Id., E. side of entrance .....	.. | ... | ... | ...
ODIEL RIVER			
Huelva Two fixed br. lts.	37 13.4 6 51.6	On the Bar. In one lead over the Bar .....	● | ... | 3 | 1853
Cartaya	.....	Fixed lt. in River, building (1861) | 3a | ... | ... | ...	
GUADALQUIVIR R.			
Chipiona	.....	Temporary lt. on Church Tower | 5a | 72 | 8 | 1855	
Espiritu Santo	.....	Fixed red light .....	... | ... | ... | 1854
Malandar Point One fixed bright lt.	36 46.3 6 21.9	.....	... | 36 | 6 | 1854
Salmedina Rocks	36 44. 6 27.	Fixed bright lt. building (1861) | ... | ... | ... | ...	
Bonanza	.....	Fixed bright light .....	... | 52 | 7 | 1854
CADIZ One rev. lt., 1 min.	36 31.2 6 18.9	W. Tower of San Sebastian, 127 feet. Br. & red flash alternately | 1b | 146 | 20 | 1855	
CAPE TRAFALGAR	36 10. 6 1.	Building on the Cape (1861) ... | ... | ... | ... | ...	
TARIFA One fixed bright light	36 0. 5 36.6	On the Island, S. of town	1a | 132 | 20 | 1813
Algeciras One fixed green light	36 7.3 5 26.1	Isla Verde, not shown from N. | ... | 46 | 5 | 1850 to W.	1855
GIBRALTAR			
EUROPA POINT One fixed bright lt.	36 6. 5 21.	On Victoria Tower, 60 feet high | 1a | 150 | 15 | 1840	
Old Mole, S.	.....	Green to N.; br. to W.; red to S. | ... | ... | ... | 1857	
New Mole Head	.....	Red light at end of works .....	... | ... | ... | ...
Ragged Staff	.....	Green light at landing place .....	... | ... | ... | ...
Old Mole Head, N.	.....	Fixed red light .....	... | ... | ... | 1850
MAROCO			
CEUTA One rev. bright lt.	35 53.7 5 17.5	Tower, 88 ft. high, on Mosqueros | 1b | 483 | 23 | 1855 Hill, Almina Point	

Visible in Miles	Year established
6	1775
20	1816
15	1850
... Coast. ... ...	...

3	1853
...	...
8	1855
...	1854
6	1854
...	...
7	1854
20	1855

20	1813
...	1855
5	1850
...	...
15	1840

...	1857
...	...
...	...
...	1850

23	1855
...	...

MEDITERRANEAN.

LIGHTHOUSES.

SPAIN. 62

Name and Character of Light.	Lat. N. Long. W. o ,	Description, &c.	Descriptio n of Apparatu s	Height above H. W. Visible in Miles	Year established.
GIBRALTAR					
EUROPA POINT One fixed bright lt.	36 6. 5 21.	Victoria Tower, 60 feet high ...	1a | 150 | 15 | 1840		
MALAGA					
One fixed and flash. lt.	36 43.5 4 25.6	Near E. Mole Head. Red flash every 2 min.....	3d | 125 | 15 | 1858		
Adra Point	36 44. 3 2.1	Building (1861)	6a | ... | ... | ....		
ENTINAS POINT					
One fixed bright light	36 41.3 2 48.8	Building (1861)	3a | ... | ... | ....		
Almeria Point	36 49.5 2 31.8	Building (1861)	6a | ... | ... | ....		
CABO DE GATA					
Aguilas Port One fixed bright light	36 43. 2 12.	Building (1861) .....	... | ... | ... | ....	
TINOSO CAPE					
One fixed bright light	37 31.3 1 9.8	Tower building (1861)	1a | 479 | 28 | 1859		
CARTAGENA					
One fixed bright light	37 35.5 0 58.6	In Battery, on Point Podadera	4a | 123 | 10 | 1856		
PALOS CAPE					
	37 37.3 0 40.6	Building (1861) on the Height	1a | ... | ... | ....		
Hormiga Grande	37 38.5 0 38.1	Building (1861) on the Islet....	5a | ... | ... | ....		
PLANA, or TABARCA ISLAND					
One fixed and flash. lt.	38 10.2 0 26.6	½ mile from E. Point	3d | 90 | 15 | 1854		
Santa Pola	38 12.5 0 30.1	On Talayola Tower, ¼ mile from Sea	6a | 499 | 7 | 1858		
Alicante	38 19.2 0 27.5	Temporary light on Rocks off Mole Head .....	... | 26 | 2 | 1855		
HUERTAS CAPE					
One fixed bright light	38 20.5 0 22.6	.....	4a | 123 | 10 | 1856		
Villa-joyosa	38 30. 0 11.6	On the Mole	6a | 52 | 5 | 1859		
	Lat. N. Long. E.				
CAPE SAN ANTONIO					
One rev. br. lt., $\frac{1}{2}$ min.	38 48.5 0 12.4	.....	2b | 571 | 18 | 1855		
	Lat. N. Long. W.				
CULLERA CAPE					
One fixed bright light	39 12.3 0 13.5	.....	3a | 92 | 15 | 1858		
Grao de Valencia					
One fixed bright light	39 28.3 0 20.	On the Mole .....	... | 37 | 7 | 1856		
El Cabanal					
One fixed bright light	39 28.8 0 20.	On Hermitage Tower .....	... | 51 | 6 | 1865		

Name and Character of Light.	Lat. N. Long. E. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles	Year established.
OROPESA CAPE One fixed and flash. lt.	40 6.6 ° 9.1	Flash every 3 min.	3d	74 | 15	1857	
COLUMBRETES R. One fixed bright light	39 54. ° 44.4	N.E. part of Monte Colibre	1a	100 | 21	1859	

BALEARIC ISL.

DRAGONERA ISLET One fixed and flash. lt.	39 35. ° 20.7	Majorca Island. Flash every 2 min.	3	1180 18	1852
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MAJORCA ISLAND

CALA FIGUERA One fixed br. light	39 27.7 ° 33.9	Yellow tower, 45 feet high, on the Cape. Palma Bay	5a	116 12	1860
Port Pi One rev. br. lt., 2 m.	39 33. ° 40.4	S. entrance. Palma Bay ....	..	132 | 8	....
Palma Port One fixed blue light	39 34. ° 40.9	On the Mole	6a	37 | 4	....
SOLLER PORT One fixed bright lt.	39 49.1 ° 43.6	Gross Point, W. entrance	4a	467 | 15	1858
C. FORMENTON	39 57.6 ° 15.5	Building (1861)	2a	.. | ..	....
Aucanada One fixed bright lt.	39 49.7 ° 12.4	On the summit of the Islet in Alaudia Bay	6a	77 | 9	1861
CAFE PERA	39 42.7 ° 9.9	Building (1861)	3a	.. | ..	....

IVIZA ISLAND

CONEIRA ID. One rev. br. lt., 1 m.	38 59.8 ° 16.5	On Cape Blanco	2b	289 | 20	1857
Cabrera Islands One fixed bright lt.	38 48.7 ° 28.8	On Ahorcados Island	6a	75 | 7	1856
Botafoch Island	38 54. ° 29.	Building (1861)	6a	.. | ..	....

FORMENTERA ID.**MINORCA ISLAND**

CABALLERIA CAPE One fixed bright lt.	40 5.7 ° 9.4	.....	2a	308 | 18	1857
Port Mahon One fixed bright lt.	39 52. ° 24.4	On Fort San Felipe	6a	74 | 7	1852
AYRE ISLAND One rev. br. lt., 1 m.	39 47.6 ° 24.2	Yellow tower, 118 feet high, on S.E. part	2b	171 20	1860
DARTUCH One fixed & flash. lt.	39 54.6 ° 52.2	S.W. Point. Flash every 3 m.	4d	70 16	1859

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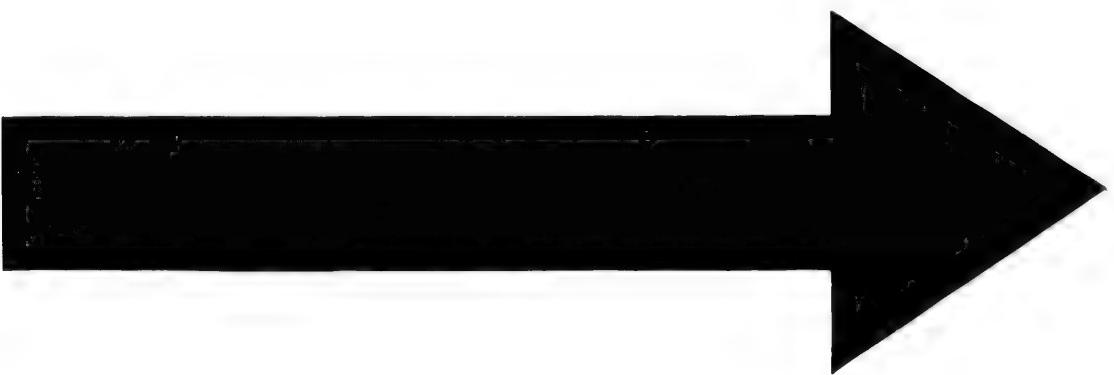
LIGHTHOUSES.

SPAIN, &c. 85

Height above H. W. Visible in Yrs.	Year established.	Name and Character of Light.	Lat. N. Long. E. ° °	Description, &c.	Description of Apparatus	Height above H. W. Visible in Miles	Year established.
74 | 15 | 1857		CAPE TORTOSA One fixed bright light	40 43. 0 36.9	At the Mouth of the Ebro R. Temporary building .....	..	34 | 11 | 1861	
190 | 21 | 1859		SALOU One fixed and flash lt. One fixed bright light	41 3.9 1 9.6	Fixed, near the Cape; flash every 4 min. Fixed lt. (temporary) on Mole, to be replaced with rev. lt.	3d | 140 | 15 | 1858 .. | 27 | 6 | 1827		
180 | 18 | 1852		TARRACONA One fixed bright light	41 6. 1 14.7	On the Mole .....	..	54 | 10 | 1832	
116 | 12 | 1860		LLOBREGAT RIVER One rev. br. lt., $\frac{1}{2}$ min.	41 19.2 2 8.9	N. of, on an old Fortress	2b | 107 | 18 | 1852		
132 | 8 | ....		Barcelona One fixed and flash lt. One green and br. lt.	41 22.2 2 11.2	Red flash every 4 m., Head. Green and br. edge of Stones off Pier Road	4d | 43 | 9 | 1859		
37 | 4 | ....		CALELLA One fixed and flash lt.	41 36.7 2 39.6	On the Height of Torreta. Flash every 2 min	3d | 166 | 18 | 1859		
467 | 15 | 1858		C. SAN SEBASTIAN One rev. br. lt., 1 min.	41 53.5 3 12.4	Near the Hermitage	1b | 548 | 22 | 1857		
... | ... | ....		CREUX CAPE One fixed & flash. br. lt.	42 18.7 3 19.3	$\frac{1}{2}$ mile in shore. Flash every 3 min.	3d | 285 | 15 | 1858		

FRANCE.

77 | 9 | 1861		CAPE BÉARN One fixed bright light	42 31. 3 7.4	$\frac{1}{2}$ mile S. of Port Vendres	1a | 751 | 23 | 1836		
... | ... | ....		Port Vendres One fixed bright light	41 31.18 3 6.7	In Fort, W. side of entrance ..	• | 98 | 10 | ....		
289 | 20 | 1857		Port Nouvelle One fixed bright light	43 0.8 3 3.9	W. Jetty Head .....	• | 33 | 10 | ....		
75 | 7 | 1856		AGDE E. Jetty One fixed bright lt.	43 16.7 3 26.6	Entrance of Hérault River ....	• | 30 | 6 | ....		
... | ... | ....		Fort Brescou One fixed bright lt.	43 15.5 3 29.9	On S.E. Bastion, 3 miles S.E. of R. Hérault .....	• | 50 | 10 | ....		
308 | 18 | 1857		MONT AGDE One rev. br. lt., 1 m.	43 17.9 3 30.1	$\frac{2}{3}$ miles E. $\frac{1}{2}$ N. from R. Hé- rault	1b | 413 | 27 | 1836		
74 | 7 | 1852		CETTE One fixed bright light Two fixed bright lights	43 23.8 3 42.1	Br. light on Fort St. Louis, on Mole Head, W. side of en- trance. 2 br. lights on S.W. Angle of Fort Richelieu, 840 yds. W.N.W. from former lt. (Will be altered.) .....	• | 105 | 15 | 1831 • | 270 | 4 | ....		
171 | 20 | 1860		AIGUES MORTES One fixed and flash. lt. One fixed red light	43 32. 4 7.9	Flash. lt., with flash every 4 m., on N. Mole of Channel. Red light on N.W. Mole Head ..	3d | 66 | 15 | ... .. | .. | 3 | 1858		
70 16 1859		CAMARGUE, or FARAH- MAN One fixed bright light	43 20.7 4 40.8	E. side of Mouth of Vieux Rhone 1a 125 18 			



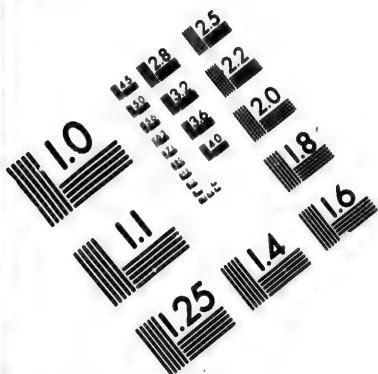
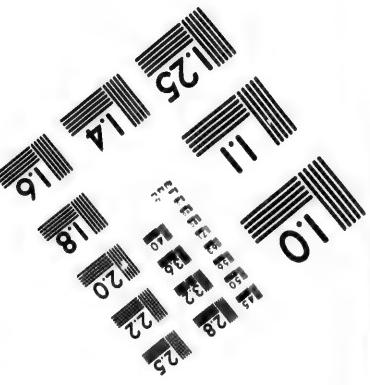
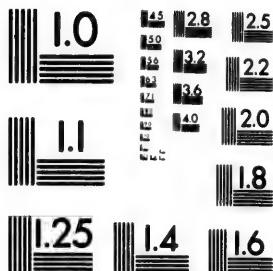
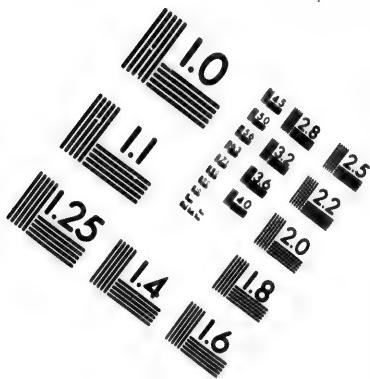


IMAGE EVALUATION TEST TARGET (MT-3)



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Name and Character of Light	Lat. N. Long. E. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
BOUO Two fixed bright lights	43 23.6 4 59.1	One on Mole Head, N. side of entrance; the other in Fort, S. side	•	52 98	10	....
MARSEILLE						
Joliette Port One fixed red light	43 17.9 5 21.4	S. Point of Mole	•	82	8	1855
FORT ST. JEAN	.....	Fixed br. lt., N. of entrance....	•	30	9	1837
Tete de More	.....	Rev. br. lt. 3 min., S. of entrance	•	62	10	1837
PLANIER ROCK One rev. br. lt., $\frac{1}{2}$ min.	43 11.9 5 14.2	.....	1b	131	20	1829
CASSIS One fixed bright light	43 12.8 5 31.9	Tower, 66 feet high, W. side of entrance	•	92	10	....
CIOTAT Two fixed bright lights	43 10.3 5 36.6	On Berouard Mole Head, N. side of entrance, and on New Mole	• ..	39 52	10 6	.... 1858
Grand Nouveau Les Am-biez	43 4.8 5 46.3	Proposed (1861) on the Islet....	...	...	...	....
SEPET CAPE One fixed and flash. lt.	43 4.1 5 56.6	On Rasca Point. Bright and red flash alternately every 3 min.	•	194	12	1851
TOULON ROAD One fixed bright light	43 6.2 5 55.5	On Grosse Tower	•	62	9	1859
GRAND RIBAUD ISLAND One fixed bright light	43 1.1 6 8.5	In W. passage to Hyères Road	•	112	10	1851
PORQUEROLLES ID. One fixed and flash. lt.	42 59. 6 12.3	On S. Point. Flash every 4 min.	1d	262	20	1837
LEVANT, or TITAN ISLAND One fixed bright light	43 2.8 6 30.5	A white tower, 39 feet high, on E. Point	3a	246	15	1837
CAMARAT CAPE One rev. br. lt., 1 min.	43 12. 6 40.4	Tower, 69 feet high	1b	426	27	1837
St. Tropez One fixed red light	43 16.4 6 38.1	On Jetty .....	..	36.	5	1857
CANNES One fixed bright light	43 32.8 7 0.8	On the Mole	•	49	10	1854
ANTIBES One fixed bright light One rev. br. lt., 2 min.	43 33.8 7 7.9	Fixed lt., on Garoupe Peninsula, $1\frac{1}{2}$ m. S. by W. $\frac{1}{2}$ W. of Antibes. Rev. light on S.E. Mole Head	1a •	338 49	20 10	1837
NICE One fixed and flash. lt.	43 41.5 7 18.	On outer Mole. Br., with red flash every $\frac{1}{2}$ min. Not lighted when Harbour is unapproachable .....	..	80	12	1855
VILLA FRANCA PT. One fixed & flash. light	43 40. 7 19.4	Flash every $\frac{1}{2}$ min.	223	18

Height above H. W. Visible in Miles.	Year established.
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52 | 10 |

98 | 8 | 1855

82 | 9 | 1837

62 | 10 | 1837

131 | 20 | 1829

92 | 10 |

39 | 10 |

52 | 6 | 1858

... | ... |

194 | 12 | 1851

62 | 9 | 1859

112 | 10 | 1861

262 | 20 | 1837

446 | 15 | 1837

26 | 27 | 1837

36 | 5 | 1857

49 | 10 | 1854

38 | 20 | 1837

9 | 10 |

0 | 12 | 1855

3 | 18 |

Name and Character of Light.	Lat. N. Long. E. ° °	Description, &c.	Description of Apparatus	Height above H. W. Visible in Miles.	Year established.
CORSICA.					
CAPE CORSE One rev. br. lt., $\frac{1}{2}$ min.	43 1.7 9 24.1	Tower, 72 feet high, on Giraglia Island	1b | 269 | 22 | 1847		
PORT ROSSA, or Rousse I. One fixed red light One fixed bright light	42 38.8 8 55.7	Red light on N.W. Point of Id. Bright light on Isola Rossa Jetty .....	● | 180 | 6 | 1857 ● | 38 | 6 | 1858		
CALVI One fixed bright light	42 35.2 8 43.3	Tower, 52 feet high, on Revellata Point.....	1a | 289 | 20 | 1844		
AJACCIO GULF One rev. br. lt., 4 min. One fixed bright lt., & One fixed red light	41 52.8 8 35.6 41 55. 8 44.4	Rev. (?) lt. on Sanguinaire Id... Fixed light on Citadel. Red lt. on Mole Head.....	1b | 322 | 20 | 1844 ● | 62 | 10 | 1851 .. | 20 | 5 | ....		
Bonifacio Port One fixed bright light	41 23.3 9 8.6	Fixed light on Madonetta Point	● | 98 | 10 | 1854		
CAPE PERTUSATO One rev. br. lt., 1 min.	42 22.2 9 11.1	Tower, 52 feet high. Strait of Bonifacio	1b | 325 | 27 | 1844		
Réccif Lavezzi, Bell Boat	41 19. 9 16.	Proposed (1861), with glasses to reflect neighbouring lights ..	.. | .. | .. | ....	
PORTO VECCHIO One fixed and flash. lt.	41 35.7 9 22.	On Chiape Point. Flash every 4 min.	1d | 217 | 20 | 1845		
Alistro	43 15. 9 34.	Proposed (1861) .....	.. | .. | .. | ....	
BASTIA One fixed bright light	42 41.6 9 26.9	On the Mole Head .....	● | 52 | 10 | ....		
Cape Caccia	40 33.4 8 5.	Building (1861) .....	.. | .. | .. | ....	
ASINARA ISLAND One fixed bright light	41 8. 8 17.8	On Caprara, or Scorno Cape, N. part of Island	1a | 262 | 24 | 1859		
PORT TORRES One fixed bright light	40 50.2 8 24.4	Asinara Gulf. E. Mole .....	.. | 49 | 10 | 1852		
TESTA CAPE One fixed and flash. lt.	41 14.7 9 8.9	Bright fixed light, with red flash every 3 min.	3b | 220 | 15 | 1845		
RAZZOLI ISLAND One fixed bright light	41 18.5 9 20.5	N. Point in Bonifacio Strait....	2a | 282 | 16 | 1845		
Caprera Island	41 14.3 9 29.7	Proposed (1861) on Galera Point	.. | .. | .. | ....	
Cape Ferro	41 9. 9 32.6	Proposed (1861) .....	.. | .. | .. | ....	
CARBONARA One rev. br. lt., $\frac{1}{2}$ min.	39 5.3 9 32.6	Cavoli Island	1b | 241 | 25 | 1858		
ST. ELIAS CAPE One fixed and flash. lt.	39 11. 9 9.3	Bright light, with red flash every 2 min.	4d | 239 | 14 | 1860		
Cagliari Harbour Two fixed red lights	39 13.8 9 7.8	One on each side of entrance ..	.. | 26 | 4 | 1866		

88 MEDITERRANEAN. Lighthouses ITALY.

Name and Character of Light.	Lat. N. Long. E.	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
Maurizio Point One fixed bright light	43 52.6 8 1.7	End of Mole.....	...	20	3	1857
Oneglia Port One fixed br. or red lt.	43 53.1 8 0.8	On Mole, E. side.....	...	26	4	1858
DELLE MELE CAPE One fixed bright light	43 57.3 8 10.6	.....	1a	307	20	1856
Vado Port One fixed bright light	44 16. 8 26.8	On San Lorenzo Fort .....	...	40	3	1857
Savona Port One fixed bright light	44 18.6 8 30.1	End of E. Mole .....	...	30	3	1857
GENOA						
Battery One rev. br. lt., $\frac{1}{2}$ m.	44 24.6 8 54.1	White square tower, at W. entrance to Mole.....	...	370	24	1841
W. Mole Head	.....	Fixed pale red light .....	...	42	6	1840
E. Mole Head	.....	Fixed & flash lt., flash every 2 m.	...	94	10	1840
Porto Fino One fixed bright light	44 18.1 9 13.3	N. side of entrance .....	...	20	3	1857
Porto Venere One fixed bright light	44 2.7 9 50.2	.....	...	20	3	1857
SPEZIA BAY One fixed bright light	44 2.1 9 53.5	S.W. part of Tino Island .....	...	384	24	1839
LEGHORN, or LIVORNO						
Mole Point One rev. br. and red lt., 40 secs.	43 32.8 10 17.7	S. part of Id. off Mole Pt. Br. and red alternately. Br. light in Marzocco Tower in stormy weather .....	...	154	19	....
Breakwater, S. Head	.....	Fixed red light .....	...	...	...	1857
Breakwater, N. end	.....	Fixed green light.....	...	...	...	1857
Jetty	.....	Fixed bright light on S.W. end N.B. The last 3' is not lighted when vessels cannot approach; but br. light is then shown on Mole Head.	...	...	...	....
Capraia Island One fixed bright light	43 2.9 9 51.1	On Ferrijone Cape .....	...	116	4	1857
ELBA ISLAND						
Port Ferrajo One fixed bright lt.	42 49. 10 20.3	On Stella Fort .....	...	200	6	....
Port Longone One fixed bright lt.	42 45.5 10 24.7	On Focardo Fort .....	...	105	6	1845
PALMAJOLA ID. One rev. br. lt., $\frac{1}{2}$ min.	42 50.5 10 27.7	On centre of Island	2b	344	20	1844
Port Ercole One fixed bright light	42 23.7 11 12.7	Rocca Fort .....	...	...	6	1830

of Apparatus	Height above H. W.	Visible in Miles.	Year established.
• | 20 | 3 | 1857			
.. | 26 | 4 | 1858			
a | 307 | 20 | 1856			
.. | 40 | 3 | 1857			
.. | 30 | 3 | 1857			
.. | 370 | 24 | 1841			
.. | 42 | 6 | 1840			
.. | 94 | 10 | 1840			
.. | 20 | 3 | 1857			
.. | 20 | 3 | 1857			
.. | 384 | 24 | 1839			
.. | 154 | 19 | ....			
.. | ... | ... | 1857			
a | ... | ... | 1857			
.. 			
.. | 116 | 4 | 1857			
.. | 200 | 6 | ....			
.. | 106 | 6 | 1845			
2b | 344 | 20 | 1844			
.. | ... | 6 | 1830			

MEDITERRANEAN.

LIGHTHOUSES.

ITALY.

89

Name and Character of Light:	Lat. N. Long. E. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
Pianosa Island	42 33. 10 6.	Proposed (1861) .....	.. | .. | .. | ..		
Monte Circeollo	.....	Proposed (1861) .....	.. | .. | .. | ..		
CIVITA VECCHIA	42 5.4	Gray tower, 89 feet high, on S.	.. | ..			1840
One rev. br. lt., 4 secs.	11 44.1	end of Breakwater	2b | 120 | 16			1860
Fiumicino	41 45.8	Tower, 89 feet high, at Mouth of	.. | ..			1825
One rev. bright light	12 11.6	R. Tiber				
Anzio, or Anzo	41 26.9	On the Mole .....	.. | ..			1825
One fixed bright light	12 42.3					
Port Nettuno	41 28.2	Mole Head .....	.. | ..		
One fixed bright light	12 43.8					
Badino	41 15.3	Extremity of Canal Portatore ..	.. | ..		
One fixed bright light	13 12.					
Terracina	41 16.9	On the Mole .....	.. | .. | ..		
One fixed bright light	13 15.4					
GAETA						
ST. CATHERINE TOWER	41 12.4 13 35.3	Red and bright, every 3 minutes	● | 235 | 18 | ..			
One rev. red & br. lt.						
St. Maria Tower	.....	Fixed bright light, entrance of Port .....	● | 86 | 8 | 1857			
PONZA ISLAND	40 53.6	On Rotunda della Madonna, S.	.. | 200 | 10 | 1858			
Two fixed bright lights	12 58.1	side of Port; and on Jetty in Battery .....	.. | 38 | 5 | 1857			
San Angelo Point	40 41.4 13 53.3	Proposed (1861) .....	.. | .. | .. | ..		
BAY OF NAPLES						
ISCHIA ISLAND						
PT. CARUSO	40 45.4	Proposed (1861)	1a | 197 | 24 | ..			
One fixed br. lt.	13 51.8					
Bagno Port	40 44.8	Rev. lt. at entrance of Port. Fixed	.. | .. | ..			1858
One rev. br. and red lt., 2 min.	13 56.5	lt., green to W., red to E.	5a | .. | 6			1857
One fixed green or red light						
PROCIDA ISLAND	40 46.2	On Chiupetto Point	4a | 75 | 12 | 1847			
One fixed bright lt.	14 0.9					
CAPE MISENO	40 46.6	Proposed (1861), on S. Point ..	4b | 75 | 25 | ..			
One rev. br. lt., $\frac{1}{2}$ m.	14 5.3					
Baia	40 48.8	Iron, 33 feet high, on Tenaglia	5a | 46 | 6 | 1850			
One fixed bright lt.	14 4.7	Fort				
Futeolano, or Puz- zuoli	40 49.3 14 7.	On New Mole .....	.. | 26 | 3 | 1860			
One fixed red light						

Name and Character of Light.	Lat. N. Long. E. o ,	Description, &c.	Description of Apparatus	Height above H.W.	Visible in Miles.	Year established.
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BAY OF NAPLES

NISITA ISLAND One rev. br. lt., 2 m.	40 47.8 14 9.8	N. Point of Mole.....	4b	78	12	1841
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NAPLES

Mole Head	One fixed red light	52	6	1843
MOLE One rev. br. lt., 2 m.	40 50.3 14 15.6	Tower, 130 feet high, on the Elbow of the Mole	3b	158	20	1843
Military Port One fixed & flash. lt.	.....	Fixed, with flash every 8 min., S. $\frac{1}{4}$ E., 600 yds. from high lt.	5d	35	10	1852
CASTELLAMARE One rev. br. lt., 1 m.	40 41.6 14 28.1	On Mole Head	4b	106	15	....
CAMPANELLA POINT One fixed bright lt.	40 34.3 14 19.2	Leads through the Bocca Piccola	4a	77	10	1846
CAPRI ISLAND One rev. br. lt., $\frac{1}{2}$ m.	40 32.1 14 12.	Proposed (1861) on Carena Point	..	..	..	....

SICILY

FARO One fixed and flash. lt.	38 15.8 15 41.5	On Pelorus Tower. Flash every 3 min.	4d	72	13	1853
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MESSINA

Citadel Point One fixed & flash. lt.	38 11. 15 34.7	On E. part, in San Ranieri Tower. Red flash every 2 min.	4d	123	12	1857
Salvatore Fort	.....	Fixed red light	3a	85	2	1858
San Ranieri	.....	Small br. lt., N. by W., from San Ranieri. To be replaced with flashing light	5a	23	3	....
Catania	37 29.2	On the Mole. Hardly distin- guishable from its. in the town	5a	..	6	1848
One fixed bright light	15 5.1					
CAPE SANTA CROCE	37 15.3	.....	4a	91	14	1859
One fixed bright light	15 15.					
AUGUSTA	37 12.5	Avola Island	4b	90	14	1858
One rev. br. lt. 3 min.	15 13.4					
MAGNISI	37 9.7	Greco Point	5a	49	10	1859
One fixed green light	15 15.					
SYRACUSA	37 3.	In Castle, N. side of entrance ..	5a	86	10	1858
One fixed red light	15 17.					
MURRO DI PORCO	37 0.2	On the Cape	3b	108	15	1859
One rev. br. lt. $\frac{1}{2}$ min.	15 19.					
PASSERO ISLAND	36 41.5	N.E. angle of Fort. Flash every	4d	128	12	1854
One fixed and flash. lt.	15 9.8	3 min.				
CORRENTI ID.	36 38.	Building (1861) flash every 2	1d	..	..	....
One fixed and flash lt.	15 3.1	min.				

Height above H. W. Visible in Miles.	Year established.							
78 | 12 | 1841								
52 | 6 | 1843								
.. | .. | 1824								
168 | 20 | 1843								
35 | 10 | 1852								
106 | 15 | ...								
77 | 10 | 1848								
.. 								
.. 								
72 | 13 | 1853								
123 | 12 | 1857								
85 | 2 | 1858								
23 | 3 | ...								
.. | 6 | 1848								
91 | 14 | 1859								
.. 								
90 | 14 | 1858								
49 | 10 | 1859								
.. 								
86 | 10 | 1858								
08 | 15 | 1859								
28 | 12 | 1854								
.. 								

Name and Character of Light.	Lat. N. Long. E. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
SCARAMIA, or SECCA POINT One fixed bright light	36 46.3 14 30.6	On the Cape	3a | 123 | 18 | 1859			
GIRGENTI One fixed and flash. lt. One fixed red light	37 16.2 13 31.3	Fixed lt., with red flash every 2 min., in the Town. Fixed red light on Mole Head	3d | 166 | 26 | 8 | 1854			
MONTE ROSELLIO One fixed and flash. lt.	37 16.8 13 27.1	On the Point. Fixed, with red flash every 2 min.	3d | 322 | 20 | 1859			
CAPE GRANITOLA One fixed and flash. lt.	37 33.8 12 37.4	On Sorello Point, flash every 3 min.	2d | 87 | 14 | 1853			
MARSALA One fixed and flash. lt.	37 48.1 12 28.1	On Mole, entrance of New Port. Flash every 3 min.	d | 55 | 12 | 1849			
FAVIGNANA ISLAND						
MARSALA POINT One fixed green light	37 55.8 12 21.3	S.E. Point of Island	5a | 61 | 10 | 1859			
SOTTILE, or MA-MONE One rev. br. lt., 1 m.	37 55.8 12 16.1	S. Point of Island	3b | 141 | 20 | 1860			
MARETIMO ISLAND	.....	Fixed and flash. light building (1861) on Libeccio Point	1d | ... | ... | ...			
LEVANZO One fixed bright light	38 3.5 12 21.4	On Cape Grosso	3a | 282 | 18 | 1858			
FORMICHE, E. ISLAND One fixed red light	38 0.8 12 26.	N.E. part of Tower	5a | 85 | 10 | 1858			
Palumbo Rock	.....	Green light on end of Breakwater	5a | ... | 2 | 1860			
TRAPANI One fixed and flash. lt.	38 1.9 12 30.1	Columbara Id., S. Point, on Mole Head. Flash every 3 min. ..	5d | 136 | 14 | 1855			
ST. VITO CAPE One fixed & flash. light	38 13.2 12 45.	Red flash every 2 min. White tower, 143 feet high	3d | 142 | 20 | 1859			
CAPE GALLO One fixed bright light	38 14.1 13 24.1	.....	4a | 145 | 15 | 1854			
PALERMO One fixed and flash. lt.	38 8.3 13 22.8	On Mole Head. Flash every 2 min.	4d | 92 | 12 | 1853			
VULCANO ID. One fixed and flash. lt.	38 20. 14 55.	Rosario, or S.W. Point. Flash every 3 min.	4d | 452 | 15 | 1853			
MILAZZO One fixed bright light	38 16. 15 18.3	N. end of Peninsula	4a | 285 | 12 | 1853			
St. Venere One fixed and flash. lt.	38 45. 16 11.5	Proposed (1861) between Pizzo and Bivona	4d | ... | ... | ...			
Reggio One fixed bright light	38 6.7 15 38.7	Church of Santa Maria, Porto Salvo .....	.. | 75 | 5 | 1857			
Taranto One fixed bright light	40 24.7 17 12.2	Cape St. Vito .....	.. | 64 | 7 | 1818			
Gallipoli	.....	Fixed br. light proposed (1861)	4a | ... | ... | ...			

92 MEDITERRANEAN. LIGHTHOUSES. MALTA ISLAND, &c.

Name and Character of Light.	Lat. N. Long. E. ○	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
MALTA ISLAND.						
Marsa Muscati Harb.	2 fixed br. Its., vertical, on Tigne Point.....	71 46	4	1859
VALETTA HARB.	35 54.	Br. lt. in St. Elmo Castle. Red	167	15	1851	
One fixed bright lt.	14 31.5	lights, vertical, on N.W. angle of Ricasoli Fort	80 55	4	1853	
Marsa Sirocco	35 49.5	On Dallamara Point	148	12	1853	
One fixed red light	14 34.	.....	.....	.....	.....
GOZO ISLAND	36 4.	Tower, 70 feet high, on N.W. Pt., near Cape Giourdan	1b | 400	24	1852	
One rev. br. lt., 1 min.	14 10.	.....	.....	.....	.....
Lampedusa Island	35 29.1	Cavollo Bianco Point.....	... | ...	... | ...	1855
One fixed bright light	12 36.1	.....	.....	.....	.....

ADRIATIC SEA.

						W. Shore.
BRINDISI	40 39.5	Fixed lt., with flash every 3 min.,	5d	72	13	1861
One fixed & flash light	17 59.5	on Petagne Rocks. Fixed lt. ..	.. | 106	10	1844	
One fixed bright light	.....	on Castello Island .....	.....	.....	.....
CAPE GALLO	40 41.1	White tower, 82 feet high, on	3b | 129	20	1861	
One rev. br. lt., $\frac{1}{2}$ min.	17 56.3	Torre di Penne .....	.....	.....	.....
Monopoli	40 57.2	On end of Jetty .....	• | ..	8	1858	
One intermitting br. lt.	17 21.	.....	.....	.....	.....
Mola	41 3.7	On the Pier .....	• | ..	9	1858	
One intermitting br. lt.	17 6.	.....	.....	.....	.....
Bari	41 6.5	On W. Mole Head	5a | 21	5	1859	
One fixed red light	16 52.7	.....	.....	.....	.....
St. Cataldo	41 9.	Proposed (1861) on the Point ..	.. | .. | ..	..	..
	16 53.	.....	.....	.....	.....
MOLFETTA	41 12.5	On detached Mole. Flash every	• | 64	14	1848	
One fixed & flash. light	16 35.6	3 min. .....	.....	.....	.....
Barletta	41 19.4	On Breakwater .....	.. | 49	4	....
One fixed bright light	16 16.9	.....	.....	.....	.....
ANCONA	43 37.7	Red light on St. Clement Mole	6a | 152	6	....
One fixed red light, &	13 30.5	Head. Rev. lt. on Monte del	2b | 406	21	1860	
One rev. br. lt., 45 secs.	.....	Cappuccini, $\frac{1}{2}$ mile E. of Port	.....	.....	.....
Sinigaglia	43 43.7	On E. Mole .....	.. | 59	6	....
One fixed bright light	13 13.	.....	.....	.....	.....
Fano	43 51.	On E. Mole .....	.. | 50	6	....
One fixed bright light	13 1.	.....	.....	.....	.....
Pesaro	43 55.	On E. Mole .....	.. | 50	9	....
One fixed bright light	12 54.	.....	.....	.....	.....
Rimino	44 5.	On E. Mole .....	.. | 69	6	....
One fixed bright light	12 34.	.....	.....	.....	.....

Height above H. W. Visible in Miles.	Year established.
71 | 4 | 1859	
46 | 4 | 1859	
167 | 15 | 1851	
80 | 4 | 1858	
55 | 4 | 1858	
148 | 12 | 1853	

400 | 24 | 1852	
... | ... | 1855	

V. Shore.	
72 | 13 | 1861	
106 | 10 | 1844	

129 | 20 | 1861	
.. | 8 | 1858	

.. | 9 | 1868	
21 | 6 | 1859	

.. 	
64 | 14 | 1848	

49 | 4 | ....	
152 | 6 | ....	

406 | 21 | 1860	
59 | 6 | ....	

50 | 6 | ....	
50 | 9 | ....	

69 | 6 | ....	
69 | 6 | ....	

Name and Character of Light.	Lat. N. Long. E. • •	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
CESENATICO One rev. br. lt., 1 min. One fixed bright light	44 12. 12 26.	On E. Mole, standing N.E. and S.W. ....	..	30 55	12 6	....
Cervia One fixed bright light	44 15. 12 23.	On the Mole .....	..	42	6	....
Ravenna One fixed bright light	44 26. 12 18.	On the Mole .....	..	42	6	....
VENICE						
Malamocco One fixed bright lt. One fixed red light	45 20.3 12 21.	Br. lt. (temporary) on Roccetta Inner Mole; red lt. on Spignon Canal. N.W. by W., and S.E. by E., 1,380 yards apart ....	..	45	12 6	1860
Porto di Lido One fixed bright lt.	45 26. 12 30.	St. Erasmo. N. side of Channel	..	..	9	....
PIAVE VECCHIA One fixed bright light	45 28.1 12 35.	On E. Point .....	..	143	14	1853
TRIESTE One intermitting br. lt.	45 38.8 13 46.	On Santa Teresa Mole. Flash of 8 secs. every $\frac{1}{2}$ min.....	3b	116	13	1858
BASSANIA One fixed bright light	45 27.3 13 30.	On Salvore Point .....	..	110	24	1818
ROVIGNO One rev. red & br. lt.	45 2.5 13 37.1	On Giovanni Rock. Alternately red and white light	3b	73	15	1854
POLA One rev. br. lt., $\frac{1}{2}$ min.	44 52.5 13 51.	Cape Compare	4b	42	10	1860
CAPE PROMONTORE One rev. bright light	44 45.3 13 53.7	On Porer Rock, 1 mile S.W. of Cape .....	..	111	15	1832
Fiume One fixed red light	45 18.7 14 25.5	Quarnero Gulf, Croatia. On Outer Mole .....	..	28	4	1859
BIANCA POINT One rev. br. lt., 3 min.	44 9.5 14 49.8	N.W. end of Grossa, or Lunga, Island .....	..	120	18	1849
ROSSO PORTO One fixed bright light	42 44. 16 52.	On Skrigava Point, S. end of Lagosta Island .....	..	342	21	1851
CATTERO GULF One fixed bright light	42 23.5 18 32.3	Point D'Ostro .....	..	263	20	1854
Durazzo One fixed bright light	41 18.32 1937.53	On the Mole .....	..	47	6	1856

IONIAN SEA.

CORFU ISLAND

TIGNOSO One fixed bright lt.	39 48.3 19 57.5	Tower, 55 feet high, on summit of Rock .....	..	100	14	1825
Corfu Harbour One fixed bright lt.	39 37.1 19 56.	In the Citadel .....	..	240	12	1822
Lefkhamo Lt. Vessel One fixed bright lt.	39 27.5 20 4.	On N. part of Shoal, in 5 fms.	40	8	1825

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Name and Character of Light	Lat. N. Long. E. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
PAXO ISLAND						
LAKA POINT One fixed bright lt.	39 13. 20 9.	White tower, 121 feet high, on N. end of Island .....	..	369 | 22	....
PORT GAYO One fixed bright lt.	39 11.5 20 12.3	White tower, 70 feet high, on Madonna Island .....	..	107 | 10	1825	
Santa Maura One fixed bright light	38 50.5 20 43.9	On the Mole .....	..	64 | 9	....
ITHACA ISLAND Two fixed br. lights	38 22.3 20 43.9	Port Vathy. On Andrea Point, E. side of entr.; & in Lazaretto	..	64 | 9 30 | 6	....
CEPHALONIA ID.						
Port Argostoli One fixed bright lt.	38 11.2 20 28.5	On Hook Point .....	..	35 | 5	....
GUARDIANA ROCK One fixed bright lt.	38 8. 20 26.5	White tower, 100 feet high ....	..	122 | 16	....
MISOLONGHI One fixed bright lt.	38 19.5 21 23.3	W. Point of entrance to Lake; 6 m. N.W. by W. & W. from Bakari Point .....	..	.. | 10	1853	
Patras One fixed red light	38 14.4 21 46.3	Column on Mole Head (light in- different?) .....	..	49 | 2	1858	
ZANTE ISLAND One fixed br. lt., & One fixed red light	37 48.6 20 54.6	Br. light on Cape Krionero; red light on Mole Head .....	..	93 | 12 30 | 4	....
STRIVALI IDS. One fixed bright lt.	37 15. 21 1.	On Convent in Stamphani Id ...	..	127 | 12	1829	
Katakolos One fixed red light	37 39.2 21 20.8	A Wooden Frame on end of New Jetty .....	..	33 | 4	1861	

ARCHIPELAGO.

CERIGO ISLAND						
SPATHI CAPE One rev. br. lt., $\frac{1}{2}$ m.	36 22.8 22 57.5	$\frac{1}{2}$ mile from N. Point of Island ..	•	363 | 24	1857	
Kapsali Bay One fixed bright lt.	36 8.5 23 0.3	E. side of Island .....	..	91 | 8	1853	
Cape Monemvassia One fixed bright light	36 41.3 23 3.8	Lighted occasionally .....	..	.. | ..	1851	
SPEZZIA ISLAND One fixed bright light	37 15.6 23 10.3	Near N.E. Point .....	..	93 | 10	....
Egina One fixed bright light	37 44.5 23 25.7	S.E. elbow of N. Mole .....	..	17 | 4	....
Cape Themistocles Two fixed lights	37 55.8 23 37.7	Vertical: upper light red and bright; lower light red .....	..	43 | 3 33 |	1859	
Pireus of Athens Two fixed lights	37 56.2 23 38.3	Red lt. on N. Mole; br. lt. on S. Mole. 72 yards apart	20 3	1839	

Height above H. W. in Miles.	Visible in Miles.	Year established
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369 | 22 |

107 | 10 | 1825

64 | 9 |

54 | 9 | 30 | 6 |

35 | 5 |

122 | 16 |

.. | 10 | 1853

49 | 2 | 1858

93 | 12 | 30 | 4 |

127 | 12 | 1829

33 | 4 | 1861

363 | 24 | 1857

91 | 8 | 1853

.. | .. | 1851

93 | 10 |

17 | 4 |

43 | 3 | 1859

33 | 3 | 1839

20 | 3 | 1839

Name and Character of Light.	Lat. N. Long. E. ° °	Description, &c.	Description of a Narrows	Height above H. W. in Miles.	Visible in Miles.	Year established
LIPSO ISLAND One fixed bright light	37 56.4 23 35.9	Grey stone tower, 46 feet high, on N.E. part .....	.. | 184 | 10 | 1854			
NEGROPONT CANAL						
Berdoun Island	38 11.1 24 5.5	Proposed (1861), on C. Aia Ma- rina .....	.. | ... | ... | ....		
Bourzi Tower	38 22.7 23 40.	Proposed (1861) .....	.. | ... | ... | ....		
ZIA	37 39.5 24 19.7	St. Nikolas, N. point of en- trance	4c | 103 | 12 | 1831			
SYRA	37 25.5 24 58.8	Rev. lt. on Gaidaro Id.; red lt. on E. Mole .....	.. | 10.5 | 20 | ..			1859
		One fixed red light		14	..	
ANDROS ISLAND	37 57.5 24 42.5	C. Fassa, N.W. Point of Id., $\frac{1}{2}$ m. inland. Flash every 3 min...	1d | 708 | 30 | 1859			
Port Kastro	38 22.6 26 9.3	Khios Id. On Mole Head ....	.. | 18 | 7 | ....			
		One fixed bright light				
Smyrna	38 25. 27 3.5	Sanjak Kalessi.....	.. | ... | 3 | 1848			
		One fixed bright light				
MITYLENI ISLAND						
The Port	39 6.	On N. and S. entrances.....	.. | ... | 6 | 1848			
	26 34.7	Two fixed bright lts.				
CAPE SIGRI	39 12.8 25 49.9	Building (1861)	1b | 164 | 24 | ....			
		One rev. br. lt. $\frac{1}{2}$ m.				
TENEDOS ISLAND	39 50. 25 58.3	Building (1861) on Ponente Pt.	3a | 98 | 14 | ....			
		One fixed bright light				
GADARO	39 50.2 26 6.	Building (1861) on Islet. Red flash every $\frac{1}{2}$ min.	4d | 66 | 12 | ....			
		One fixed & flash. light				
RHODES	36 27. 28 16.2	On Mole Head.....	.. | 94 | 12 | ....			
		One fixed bright light				
CANDIA ID.						
CANEA	35 38.8 24 1.3	On Mole Head.....	.. | 85 | 12 | ....			
		One fixed bright lt.				
Cape Drepuno	35 28. 24 15.	Red light proposed (1861) .....	.. | ... | ... | ....		
Suda Island	35 29. 24 9.3	Green light proposed (1861) .....	.. | ... | ... | ....		
Rhithymna, or Rithymno	35 22. 24 28.5	Fixed bright light, on Mole ....	.. | 60 | .. | 1850			
Megalo Kastron	35 21.3 25 8.3	In the Fort .....	.. | 47 | .. | ....			
		One fixed bright lt.				

96 MEDITERRANEAN. LIGHTHOUSES. DARDANELLES, &c.

Name and Character of Light.	Lat. N. Long. E. ° °	Description, &c.	Period of Apparition Secs.	Inten- sity High Med. Low	W. Miles	S. Miles	Tide State
Koum Kaleh Two fixed red lights	40 0.3 26 12.4	On W. Battery, S. side of Dardanelles: vert., a few feet apart	..	50	4	1856	
CAPE HELLAS One rev. br. lt. 1 min.	40 2.3 26 11.2	Tower, 33 feet high	2b	99	18	1856	
Seddul Bahr	.....	2 green lights, vertical, on a Pole	..	36	4	1856	
KHEPHAS, OR BARBER'S PT. One fixed & flash. red lt.	40 5. 26 22.3	On ruined Battery. Red flash every $\frac{1}{2}$ min. Building (1861)	4d	46	12	1857	
Kilid Bahr Two fixed green lights	.....	Vertical; on Namaziah Fort ..	..	36 20	4	1858	
Chanak Kaleh Two fixed red lights	40 8.5 26 24.7	Vertical; on Battery, W. of town .....	..	66 46	4	1858	
NAGARA POINT One fixed & flash. light	40 11.5 26 25.	On the Tower; red flash every 10 secs.	4d	39	10	1858	
Bovali Kalesi Two fixed green lights	40 12.5 26 24.	Vertical; on Fortress .....	..	46 26	4	1858	
Piskieri Cape Two fixed red lights	40 18. 26 35.	Vertical. (Proposed?) .....	..	66	4	....
Galata Two fixed green lights	40 19.1 26 35.5	Vertical. $\frac{1}{2}$ mile S. of Village .....	..	62 42	4	1858	
Chardakh Two fixed red lights	40 23. 26 41.	Vertical. On low Point .....	..	59 39	4	1858	
GALLIPOLI One rev. br. lt., $\frac{1}{2}$ min.	40 24. 26 39.	W. Shore	•	108	18	1856	
Fanous Point One fixed bright light	40 24. 26 44.3	E. Shore .....	..	..	..	....

SEA OF MARMORA.

Kutali Island One fixed bright light	40 33. 27 28.3	Building (1861) on N.W. part..	6a	66	8	....
Palio Point Two fixed red lights	40 29.3 27 40.5	Building (1861) .....	..	59	4	....
MARMORA ISLAND One fixed and flash. lt.	40 37.7 27 46.	On Fanar Id., off E. Point. Red flash every 2 min.	4d	132	12	1857	
KHORAZ POINT One rev. br. lt., $\frac{1}{2}$ min.	40 42. 27 18.	Building (1861)	2b	98	18	....
EREKLI POINT One fixed bright light	40 58.6 27 58.2	.....	5a	49	10	....
STEPHANO BURUN One fixed and flash. lt.	40 57.3 28 50.6	Tower, 65 feet high, 1 mile N.E. of Cape. Flash every 2 min.	3d	79	12	1857	
FANAR BAY One fixed red br. light	40 58. 29 2.	On S. Point	4a	84	12	1856	
CONSTANTINOPLE One fixed and flash. lt.	41 0.5 28 59.4	White tower, 147 feet high, on Seraglio Pt. Flash every min.	•	150	15	1858	
Skutari Two fixed red lights	41 1. 29 0.7	Vertical; in Leander Tower....	..	79 59	4	1857	

THE BOSPHORUS, Lighthouses. AND BLACK SEA. 97

Lat. above Eq.	Long. in Hrs.	Lat. Long. in Mins.	Year
50 | 4 | 1856			
59 | 18 | 1856			
36 | 4 | 1856			
46 | 12 | 1857			
36 | 4 | 1858			
20 | 4 | 1858			
66 | 4 | 1858			
46 | 4 | 1858			
39 | 10 | 1858			
46 | 4 | 1858			
26 | 4 | 1858			
60 | 4 | ....			
62 | 4 | 1858			
42 | 4 | 1858			
59 | 4 | 1858			
39 | 4 | 1858			
108 | 18 | 1858			
.. 			
KARA BURUN	41 19.3	On the Cape	1c | 302 | 22 | 1856
	28 41.		
CAPE SHABLAH	43 33.5	In Beacon Tower, 82 feet high..	.. | 120 | 10 | 1856
	28 38.7		
Kustenjeh	44 10.	White tower, 45 feet high, on	4a | 68 | 9 | 1860
	28 39.2	Cape	
DANUBE RIVER	45 9.4	White tower, 58 feet high, on S.	.. | 65 | 15 | 1856
	29 40.5	side of Sulina, or Middle, entr.	
FIDONISI	45 15.6	White tower, 70 feet high, on	.. | 195 | 18 | 1856
	30 12.7	summit of Island.....	
Dniester River	46 4.8	Mast, with three yards, with	.. | 52 | 4 | 1817
	30 30.2	lights on the lowest, on Tsa-	
		rigrad, or S. Pass	
ODESSA			
CAPE FONTANE	46 22.6	White tower, 76 feet high, about	.. | 200 | 16 | 1834
	30 46.9	2 leagues S. of town	
Quarantine Mole	46 29.5	Vertical, on a Staff, on yellow	.. | 86 | 11 | 1834
	30 46.5	building, 77 feet high.....	
Kinburn Light Vessel	46 35.5	Entrance of Dneiper Limani, 100	.. | 46 | .9 | 1834
	31 30.4	yds. from Kinburn Spit. Ver-	
		tical lights	
60 | 15 | 1858			
79 | 4 | 1857			
69 | 4 | 1857			

Name and Character of Light	Lat. N. Long. E. o	Description, &c.	Description of Apparatus	Height above Water in Miles	Visible in Miles	Year
Tophana One fixed bright light	41 1.3 29 0.3	A small light on the Rock.....	..	..	..	1854
Defterdar Point	.....	2 green lights proposed (1861) ..	..	..	..	....
Roumili Hissar	.....	2 green lights proposed (1861) ..	..	..	..	....
Khandilli Point	.....	2 red lights proposed (1861) ....	..	..	..	....
Khanlijeh	.....	2 red lights proposed (1861) ....	..	..	..	....
Yeni Keui Lt. Vessel	.....	3 green lights proposed (1861) ..	..	..	..	....
Umur Banks Lt. Vessel One fixed bright light	41 9.3 29 4.7	W. part.....	..	49	4	1857
Therapia	.....	2 green lts. proposed (1861) in Battery .....	..	..	..	....
Jeron Point	.....	2 red lts. proposed (1861) in Fort	..	..	..	....
<hr/>						
BLACK SEA.						
ROUMILI One fixed bright light	41 14.2 29 7.	European side of Mouth of Bos- phorus .....	..	190	18	1856
ANATOLIA One fixed and flash. lt.	41 12.8 29 10.2	Asiatic side of Mouth of Bos- phorus. Red flash and two br. flashes every 2 min. ....	..	294	20	1856
KARA BURUN One flash. light, 10 secs.	41 19.3 28 41.	On the Cape	1c	302	22	1856
CAPE SHABLAH One fixed bright light	43 33.5 28 38.7	In Beacon Tower, 82 feet high..	..	120	10	1856
Kustenjeh One fixed bright light	44 10. 28 39.2	White tower, 45 feet high, on	4a	68	9	1860
DANUBE RIVER One fixed bright light	45 9.4 29 40.5	White tower, 58 feet high, on S.	..	65	15	1856
FIDONISI One rev. br. lt., 3 min.	45 15.6 30 12.7	White tower, 70 feet high, on	..	195	18	1846
Dniester River Two fixed br. lights	46 4.8 30 30.2	summit of Island.....	..			
ODESSA						
CAPE FONTANE One fixed bright lt.	46 22.6 30 46.9	White tower, 76 feet high, about	..	200	16	1834
Quarantine Mole	46 29.5 30 46.5	Vertical, on a Staff, on yellow	..	86	11	1834
Kinburn Light Vessel Two fixed bright lts.	46 35.5 31 30.4	building, 77 feet high.....	..	74	10	1854

98 BLACK SEA, Lighthouses. AND SEA OF AZOF.

Name and Character of Light.	Lat. N. Long. E. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established
TENDRA ISLAND One rev. br. lt., 1 min.	46 19.4 31 31.5	13½ miles S., ½ W., from Kinburn Fortress	•	84	15	1827
TARKAN CAPE One fixed bright light	45 20.8 32 30.	White tower, 113 feet high, on S.W. extremity .....	..	117	12	....
Eupatoria	.....	Building (1861) .....	..	..	..	....
KHERSONESE One rev. br. lt., 2 min.	44 35. 33 22.7	White tower, 113 feet high, at entrance to Sebastopol .....	..	116	12	1846 1856
SEBASTOPOL Two fixed bright lights	44 37.2 33 35.3	One on high Cape, near Inkerman; the other at head of Harb., near Mount Mekenzieff; E. by S. and W. by N., 1½ m. apart .....	.. ..	402 612	28 23	1847
AITODOR CAPE One fixed bright light	44 25.3 34 7.7	Tower, 38 feet high .....	..	343	21	....
TAKLI One fixed pale light	45 6.6 36 27.2	Entrance to Kertch Straits ....	..	313	20	1847 1857
Trebizond	.....	Building (1861) .....	..	..	..	....
Bender Erekli One fixed bright light	41 18.1 31 26.	2½ miles N. of Cape Baba .....	..	656	8	1854
KILI CAPE One rev. br. lt., 1 min.	41 10. 29 38.2	Tower, 49 feet high	1b	221	25	1859

SEA OF AZOF.

YENI KALEH One fixed bright light	45 23.2 36 39.6	On Cape Fanar, N.W. entrance of Kertch Straits, 2½ miles from Fortress .....	..	342	21	1822
BERDIANSK One rev. br. lt., 1 min.	46 38.3 36 47.7	600 yards, E.N.E. ½ E., from end of Spit .....	..	85	10	....
BIRLOSARAI One fixed bright light	46 52.7 37 20.7	White tower, 79 ft. high, on Sandy Neck, 2,400 yards from end of Spit .....	..	74	10	1847 1856
Sasalnitzk Light Vessel Two fixed bright lts.	46 59.3 38 15.	Vertical; on S. side of Channel and of Spit. Removed, in winter, to Taganrog .....	..	34 22	7 6	1856
Golden Bank Lt. Vessel One fixed bright light	47 2.5 38 35.5	2 miles from Shoal, S.S.W. of Foursoff. Removed, in winter, to Taganrog .....	..	34	7	....
Gretcheskoi Light Vessel One fixed red light	47 2.7 38 46.4	.....	..	..	..	....
Petrouchnia Light Vessel One fixed bright light	47 4.3 38 53.1	.....	..	..	..	....

Above H. W. Visible in Miles.	Year established.	Name and Character of Light.	Lat. N. Long. E. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
4 | 15 | 1827		Alexandrette	36 35.5	Iakenderun Gulf, W. point of	...	...	...	1858
		Two fixed bright lts.	36 16.	Road. For Mail Steamers ..				
7 | 12 | ....		Latakiyah	35 30.5	On the Castle, N. side .....	...	...	...	1842
		One fixed bright light	35 46.					
.. 								
.. | .. | 1846								
6 | 12 | 1856								
02 | 28 | 1847		Port Said	31 16.	Wooden tower, on Beach	3a | 66 | 9 | 1860			
02 | 23 | ....		One fixed bright light	32 19.5					
		NILE RIVER						
		Damietta Mouth	31 25. 31 47.	Proposed (1861) .....	.. | .. | .. | ..		
		Rosetta Mouth	31 24.3 30 28.	Proposed (1861) .....	.. | .. | .. | ..		
		ALEXANDRIA	31 11.1	White stone tower, Eunostos Pt.	.. | 180 | 20 | 1848			
		One fixed bright light	29 52.4					
		TUNIS.						
		CAPE CARTHAGE	36 52.	Tunis Gulf .....	.. | 406 | 15 | 1840			
		One rev. br. lt., 1 min.	30 49.3					
		Goletta	36 48.3	(Not lighted since 1852). .....	.. | 39 | 6 | 1850			
		One fixed bright light	30 18.7					
		I CANI, AL KHEL, or DOG ROCKS	37 21. 30 4.6	White tower, 70 feet high, on highest Rock	2a | 129 | 17 | 1860			
42 | 21 | 1822		One fixed bright light						
		ALGIER.						
		PORT LA CALLE	36 54. 38 26.2	E. side of entrance .....	● | 52 | 10 | 1844			
		One fixed bright light						
		BONAK	36 54.5 7 46.3	On Lion Point, $\frac{1}{4}$ mile N.E. of Port .....	● | 180 | 10 | 1841			
		One fixed bright light						
		HAMRAH, or CAPE DE GARDE	36 58. 7 47.2	Lighthouse, 43 feet high	2b | 406 | 15 | 1841			
		One rev. br. lt., $\frac{1}{2}$ min.						
		STORA GULF						
		Singes Island	36 54.3 6 51.5	.....	● | 118 | 8 | .....			
		One fixed bright lt.						
		Scrigina Island	36 56.3 6 52.7	.....	● | 180 | 10 | .....			
		One fixed bright lt.						
		Jijelli	36 50. 5 43.9	On second Rock from E. .....	● | 49 | 8 | 1844			
		One fixed bright light						

Name and Character of Light	Lat. N. Long. E. °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
Bougie. One fixed bright light	36 45.5 5 5.3	On Fort Abd-el-Kader	•	128	3	....
Bouac Fort	.....	Red lt., 1 m. N.E. $\frac{1}{2}$ E. of Bougie	•	482	8	1854
CARBON CAPE One rev. br. lt., 1 min.	36 46.9 5 6.3	Tower, 35 feet high, on Cape ..	1b	722	27	1854
Dellis Point One fixed bright light	36 55.5 3 55.2	.....	•	..	8	1844

ALGIER

IT. DE LA MARINE One rev. br. lt., $\frac{1}{2}$ m.	36 47.3 3 4.3	White tower	2b	115	15	1834
N. Mole Head	.....	Red light	•	36	3	1850
S. Mole Head	.....	Green light	•	25	3	1854
SHERSHEL Two fixed bright lights	36 36.8 2 11.9	High light on Fort Joinville; the other on Pier	•	124 46	15 8	1843
Tenez One rev. bright light	36 32. 1 20.2	In front of town	•	131	8	1844
Mostaghanem One fixed bright light	35 55.1 0 5.4	On small tower, near Barracks	4a	121	10	1844 1859

Lat. N.
Long. W.

ARZEW Two fixed bright lights	35 51.6 0 17.2	In Fort on Point, and higher lt. on Islet	•	30 62	8 10	1841 1848
ORAN One rev. br. lt., $\frac{1}{2}$ min.	35 44.3 0 41.3	White tower on Fort Mors-el- Kébir	2b	118	15	....
Honain, or Djama Ghazaouat One fixed bright light	35 7. 1 52.3	E. Point of Bay	•	164	8	1848

MAROCCO.

Melilla One fixed bright light	35 18. 2 57.	On Bastion, N.E. of Village....	..	..	5	....
Al-Khuzemas, or Alhucemas One fixed bright light	35 13.4 3 53.	Torre Vigia .....	..	123	7	1852
CEUTA One rev. br. lt., 1 min.	35 53.9 5 17.5	Tower, 88 feet high, on Mosque- ros Hill, or Almina Point	1b	476	23	1855

AFRICA.

LIGHTHOUSES.

West Coast. 101

Visible in Miles.	Year established.	Name and Character of Light.	Lat. N. Long. W.	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
3 | ...		Senegal One fixed bright light	16 0.8 16 31.	(French). Ile de St. Louis, ....	...	...	6 | ....	
8 | 1864		Gorée Island One fixed bright light	14 39.0 17 24.8	(French). In the Fort .....	...	...	6 | ....	
27 | 1854		SIERRA LEONE One fixed bright light	8 30. 13 18.5	(British). White tower, 69 feet high, on the Cape. Green lt. at landing place .....	...	96 | 18	1849	
8 | 1844		MONROVIA One fixed bright light	6 19. 10 50.	(Liberian). Red tower, 40 feet high, on Cape Mesurado ....	...	240 | 15	1855	
15 | 1834		CAPE PALMAS One fixed bright light	4 22.1 7 44.3	(Liberian). Tower, 50 ft. high, on the Cape .....	...	110 | 13	....
3 | 8 | 1850		CAPE COAST CASTLE One fixed bright light	5 6.3 1 13.9	(British). White tower, 46 feet high, in Fort William .....	...	192 | 20	1847	
3 | 8 | 1854								
16 | 8 | 1843								
10 | 1859								
8 | 1844								
10 | 1848								
15 | ...								
8 | 8 | 1844								
10 | 1848								
8 | 1848								
5 | ...								
7 | 1852								
23 | 1856								

ATLANTIC ISLANDS.

BERMUDAS. One rev. br. lt., 1 min.	32 15.1 64 51.6	A white iron tower, 106 ft. high, on Gibbs Hill, on S. side. Seen all round, except between S. 48° W., and S. 52° W.; and also S. 53° W. to S. 62° W. . .	362 24 1846
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CANARY ISLES.

Santa Cruz One fixed bright light	28 28.6 16 14.9	(Spanish). Teneriffe Island; on Mole Head	36 5 1857
Anaga	27 35.2 16 5.7	Teneriffe Island. Proposed light on the Islet, 1860 .....	... | ... | ... | ....
Grand Canary Island One fixed bright light	28 7.1 15 24.8	On the Mole, Palma town.....	... | ... | ... | 1859

AZORES, or WEST-
ERN ISLANDS.

ST. MICHAEL Proposed fixed light	37 44. 24 41.2	(Portuguese). At Santa Clara Fort. Punto Delgada
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Name and Character of Light.	Lat. S. Long. E. o /	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
TABLE BAY						
ROBBEN ISLAND	33 48. 18 22.7	Red light building, 1861, on highest part.....	1a	115	...	....
MOUILLE POINT One fixed bright lt.	33 53.9 18 24.7	(To be altered to red light).....	...	40	10	1844
GREEN POINT Two fixed bright lts.	33 54.1 18 24.1	Horizontal, in one tower .....	..	65	13	....
CAPE OF GOOD HOPE One rev. br. lt., 1 min.	34 21.2 18 29.5	White tower, 30 feet high, on the Cape	1b	816	36	1860
SIMON'S BAY						
SOUTH ROMAN ROCK One rev. br. lt., $\frac{1}{4}$ m.	34 10.7 18 27.5	Building ; to be lighted in 1861, to supersede the Light Vessel	3b	54	12	....
S. Roman Rock Lt. V. One rev. br. lt., $3\frac{1}{2}$ m.	34 12. 18 27.5	200 yds. N. of Rock, in 19 fms. To be removed when lighthouse is lighted .....	..	37	10	1845
CAPE AGULHAS One fixed bright light	34 49.8 20 0.6	White and red striped tower, 100 feet high, on the Point ..	1a	128	18	1848
ALGOA BAY						
C. RECIFE One rev. br. lt., 1 m.	34 1.7 25 42.1	Tower, red and white, 80 feet high, on the Point .....	..	93	15	1850
Port Elizabeth	.....	Fixed lt., building (to be lighted in 1861) on hill behind town	..	200	...	....
BIRD ISLANDS Two fixed bright lts.	33 50.4 26 17.2	In one tower, on S. side .....	..	61	10	1852
BUFFALO RIVER One fixed bright light	33 0.7 27 58.7	East London. On Reef, S. side of entrance .....	..	45	11	1860
RÉUNION, or BOUR-BON ID.						
St. Denis Two fixed bright lights	20 51.5 55 30.2	12 feet apart vertically, on a Flagstaff on the Barachois ..	..	85	8	1846
BEL-AIR One fixed bright light	20 53.2 55 39.4	Tower, 66 feet high, on the Point.....	2a	151	18	1846
MAURITIUS ISLAND						
St. Louis One green and one red fixed light	20 9. 57 29.	Green light on Fort George, on Tonneller Id. Red lt. on Martello Tower, entr. of Gr. River	..	...	...	1856
CANNONIER POINT One fixed br. (& red) lt.	20 0.6 57 35.4	Appears red, when bearing N. of N.E. $\frac{1}{4}$ E. ....	..	38	10	1855
FLAT ISLAND One rev. br. lt., 1 min.	19 53.4 57 44.2	S.W. Angle .....	..	365	25	1855
ARABIA, S. Coast						
Aden Light Vessel One fixed bright lt.	12 47. 45 1.3	In 24 feet, S. side of Inner Harbour .....	..	35	7	1850

RED SEA

LIGHTHOUSES.

AND INDIA. 103

Name and Character of Light.	Lat. N. Long. E. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established
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RED SEA.

PERIM ISLAND One rev. bright light	12 38. 43 23.	Building, 1861
DEDALUS SHOAL One fixed bright light	24 55. 35 50.	Building, 1861	2a	...	12
JUBAL STRAIT One rev. bright light	27 43. 33 43.	On Ushruffee Reef	1b	...	18	1861
ZAFARINA POINT One fixed bright light	29 5.1 32 40.	Building, 1861	1a	...	13	....
Suez Light Vessel One fixed bright light	29 54.8 32 36.3	E. side of Harbour .....	...	...	6	1856

INDIA,

W., and Malabar Co.

KURRACHEE, or KA- RACHI One fixed bright light	24 47.3 66 58.3	On Fort Manora Point, W. en- trance of Indus River .....	...	120	16	1851
MANDAVEE One fixed bright light	22 49.7 69 20.4	Entrance to Gulf of Kutch; on S.W. Bastion of Fort .....	...	80	16	1853

CAMBAY GULF

PERIM ISLAND One fixed bright lt.	21 35. 72 20.	On a Mast .....	..	66	12	1851
Gogah	21 40.5 72 16.5	A small fixed light .....	..	..	..	1856
KOON BUNDER One fixed bright lt.	22 17. 72 18.3	W. bank of Sabernatty River. Sept. 1 to June 15 .....	..	48	10	1856
DEOJUGAN, or TAN- KARIA One fixed br. light	21 55. 72 30.5	N. Bank of Dhardur River .....	..	50	10	1856
Bleagura Dandee One fixed br. light	21 19.7 72 35.	.....	..	..	..	1856
TAPTEE One fixed br. light	21 5. 72 37.5	N. shore of Mouth of River, on a Mast .....	..	61	10	1852

BOMBAY

COLABA LT. VESSEL One fixed br. light	18 50. 72 47.5	In 7 fms., 4½ miles S.S.W. from Colaba Pt. A blue light every hour, and false fire every ½ hour	..	60	12	1842
Shannon One fixed br. light	18 53.5 72 50.	½ mile S. of sunken Rock .....	..	..	..	....
COLABA POINT One rev. br. lt., 2 m.	18 53.7 72 47.7	White tower, 89 feet high, on the Point .....	..	132	17	1847
Dolphin Rock	.....	One fixed green light .....	..	20	2	1857
GOA One rev. br. lt., 7 (?) m.	15 28.5 73 46.	Flagstaff on Aguada Fort, on a Hill behind the town .....	..	280	12	....

Name and Character of Light.	Lat. N. Long. E. o	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
Coumta One fixed bright light	14 25. 72 22.5	Lantern on a Column.....	...	180	...	1855
MANGALORE One fixed bright light	12 51.5 74 49.4	Tower, 50 feet high .....	...	250	16	1851
CANNANORE One fixed bright light	11 51.3 75 21.7	Not shown during S.W. Monsoon .....	...	110	12	1843
TELlicherry Two fixed bright lights	11 44.8 75 28.5	12 yards apart, vert. Not shown during S.W. Monsoon .....	...	40 104	12	1835 1846
CALICUT One fixed bright light	11 15.2 75 45.6	On a Column, 110 ft. high, near the Beach. Not shown during S.W. Monsoon .....	...	105	12	1847
COCHIN One fixed bright light	9 58.1 76 13.9	On a Staff.....	...	67	12	1839

CEYLON.

COLOMBO One fixed bright light	6 56. 79 50.2	In Clock Tower. (Removed from W. Bastion.) .....	...	132	16	1860
POINT DE GALLE One fixed bright light	6 1.4 80 11.2	On S. Bastion .....	...	100	12	1848
GREAT BASSAS LT.V. 8 1.28.	6 11. 8 1.28.	Proposed, 1861 .....	...	...	...	....
TRINCOMALEE Flagstaff Point	8 33.7 81 14.7	Lantern, in Fort Frederick. (Will be discontinued when Foul Pt. and Round Id. Its. are lighted.)	...	206	7	1845
FOUL POINT One rev. br. lt., 1 m.	.....	Building, 1861	2b.	...	18	....
ROUND ISLAND One fixed red light One fixed green light	.....	Building, 1861, red lt. between S.W. and W. by S. & S. Green light to lead into Harbour	4a	...	10	....

Coromandel Coast.

TUTICORIN One fixed bright light	8 47.3 78 10.9	Obelisk, 37 ft. high, on Hare Id., 2½ miles E. of Tuticorin .....	...	43	12	1845
PALK BAY One fixed bright light	9 17.5 79 12.6	Round tower, 41 ft. high, 1 m. E. of Paumben Pass .....	...	84	12	1845
NEGAPATAM One fixed bright light	10 44.8 79 50.2	Lowered to 88 feet during N.E. Monsoon .....	...	100	12	1846
Karikal One fixed bright light	10 55. 79 44.	On a Flagstaff .....	...	65	8	1853
PONDICHERRY One fixed bright light	11 55.7 79 49.9	In the Square .....	...	131	15	1836
MADRAS One fixed and flash. lt.	13 5.2 80 14.	Column, 125 ft. high, on Esplanade N. of Fort. Flash every 2 min. .....	...	132	24	1844
Pudicat	13 25. 80 19.7	Building, 1861.....	...	...	...	....

Miles. Year established	Name and Character of Light.	Lat. N. Long. E. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established
.. | 1855	ARMEGON SHOAL One fixed bright light	13 52.8 80 12.	Village of Moonaa, or Moonapolum, 1 mile in shore .....	..	95 | 15	1853
16 | 1851	MASULIPATAM One fixed bright light	15 58.9 81 9.5	2 miles N.W. of Point Divy....	..	90 | 12	1851	
12 | 1843	GODAVERY, or GOR- DEWARE, PT. One fixed bright lt.	16 49.1 82 18.4	White tower, 80 ft. high, 1½ m. W. by N., on Hope Id., Corin- gah Bay .....	..	73 | 15	1817
12 | 1835 1846	SANTIPILLY One fixed bright light	18 3.5 83 36.6	On Conada Hill, ¼ mile in shore	..	150 | 14	1849	
12 | 1847	FALSE POINT One fixed bright light	20 20. 86 47.3	2 miles S.W. of Point.....	..	120 | 18	1838	
12 | 1839	PILOT RIDGE LT. VESSEL One fixed bright light	20 49.5 87 42.	Moored in 21½ fms. during S.W. Monsoon. Blue lt. and a mar- oon alternately every ½ hour	..	.. | ..	1851
16 | 1860	HOOCLEY RIVER LT. VES. One fixed bright light	21 4. 88 14.	From October to March in 7½ fms. at entrance to E. channel, with maroon or torch every ½ hour, and blue lt. every hour. From March 15 to Sept. 15 is removed to lat. 21° N., with blue lt. every ½ hour, and mar- oon every ¼ hour .....	..	.. | ..	1843
12 | 1848							
.. 							
3 | 7 | 1845	HOOCLEY RIVER LT. VES. One fixed bright light	21 26.3 88 6.7	In Gaspar Channel. Blue lts. and maroons alternately .....	..	.. | ..	...
.. | 18 | ...	Mutlah River Lt. Vessel One fixed bright light	21 6. 88 4.8	In 9 fms.; temporary. From Mar. 16 to Oct. 16, a rocket at 8 p.m., midnight, and 4 a.m. ....	..	30 | 7	1857
.. | 10 | ...							
ndel Coast. 3 | 12 | 1845	SAUGOR ISLAND One br. rev. lt., 20 secs.	21 38.7 88 5.	Iron tower, 82 feet high, on Mid- dleton Point.....	..	88 | 15	1852	
4 | 12 | 1845	COWCOLLY, or KEDGEREE One fixed bright light	21 50.3 87 57.1	2 miles S.W. of Point .....	..	62 | 15	1810

BAY OF BENGAL,**East Coast.**

0 | 12 | 1846	KOOTUBDEAH ID. One fixed bright light	21 52.5 91 51.	Tower, 106 feet high, on W. part .....	..	120 | 18	1846
5 | 8 | 1853	ARRACAN, or AKYAB, RIVER One fixed bright light	20 5.3 92 56.5	Tower, 50 feet high, on Great Savage Id., S. entrance .....	..	106 | 15	1844
1 | 15 | 1836	BORONGO, W. ID. One fixed bright light	20 1. 92 56.	Summit of Table-land .....	..	.. | ..	1859
2 | 24 | 1844	TERRIBLES	19 22. 93 16.	Proposed (1861) off Kyouk Phyou	..	.. | ..	...
.. | ... | ...	ALGUADA REEF	15 42. 94 13.	Proposed (1861) on Cape Ne- grais .....	..	.. | ..	...

Name and Character of Light.	Lat. N. Long. E. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles	Year established.
RANGOON Elephant Point	16 28. 96 23.	Proposed (1861) .....	...	..	..	....
Light Vessel One fixed bright lt.	16 19. 96 20.5	In 3½ fathoms, at entrance. <i>Blue</i> light every hour .....	...	..	..	....
AMHERST POINT One fixed bright light	16 5. 97 39.	.....	...	..	10	....
Double Isle	15 54. 97 39.5	Proposed (1861) on N. Point ..	...	..	..	....
MALACCA STRAIT LIGHT VESSEL One fixed bright lt.	2 52.5 100 58.3	In 4 fms., on W. part of One Fathom Bank. (To be replaced with a pile Lighthouse) ....	...	..	13	1852
MALACCA One fixed bright light	2 12.5 102 15.2	On St. Paul Hill .....	...	180	16	, 349
RAFFLES One fixed bright light	1 8.3 103 44.6	White tower, 91 feet high, on Coney Islet, Straits of Singa- pore .....	..	105	12	1855
Singapore One fixed bright light	1 16.3 103 51.3	Flagstaff, on Government Hill	..	226	7	1855

EAST INDIAN ISLANDS.

HORSBURGH, or PEDRA BRANCA	1 20.3 104 25.1	White tower, 93 feet high, on summit of Rock .....	..	95	15	1851
One rev. br. lt., 1 min.						

Lat. S.
Long. E.

JAVA

ANJER One fixed bright lt.	6 4.8 105 56.6	Strait of Sunda. On Point, 5 m. | ... | 96 | 16 | 1855 S.W. of the Port .....	...	96	16	1855
Anjer Two fixed bright lts.	6 3.2 105 57.	On each Pier, at the Village ..	..	35	4	1856
Batavia	6 8. 106 52.	Proposed (1861) .....	..	..	..	....

BANKA STRAIT

Tober Ali	3 1. 106 28.	Proposed (1861) in the Fort .. | ... | ... | ... | ....	...	..	..	....
Pulo Dahan Lt. Vessel	2 55. 106 11.	Proposed (1861) 4½ m. S. of Islet, in Stanton Channel .....	..	..	..	....
KALIAN One fixed bright lt.	2 6. 105 19.	Building (1861) on the Point ..	2a	160	16	....
Mintok	2 5.5 105 11.	Building (1861) on the end of Pier .....	..	..	..	....

Name and Character of Light.	Lat. N. Long. E. o /	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established
PHILIPPINE IDS.						
Zebu Port One fixed bright lt.	10 21.5 123 49.4	Dapdap Point, N.E. entrance...	...	49	4	1857
Romblon Island One fixed bright lt.	12 37.6 123 15.9	Sabang Point, N. entrance ....	...	...	...	1857
CORREGIDOR ID. One rev. br. lt., 1 m.	14 23.1 120 33.5	Manila Bay. On summit of Island	2b | 639	20	1853	
Caballo Island One fixed bright lt.	14 22.3 120 36.	Manila Bay	4a | 345	9	1853	
MANILA One fixed bright lt.	14 36.2 120 56.6	N. shore of Canal .....	...	51	10	1846

CHEATINA

CANTON RIVER		.....	| Two red lts., on Dutch Folly Fort | .. | .. | .. | 1859
PRATAS SHOAL		20 42. 116 43.5	| Proposed (1861)..... | .. | .. | .. | ..
Swatow, or Shantau One fixed bright light		23 20. 116 43.7	| Double Island. (Doubtful.) .. | .. | .. | .. | 1858
TAETAN ISLAND.		24 24.5 118 9.3	| Building (1861) on N.W. Id... | .. | .. | .. | ..
Pescadores		23 33. 118 9.3	| Fisher Inlet. (Occasional.) .. | .. | 225 | .. | ..
Yang-tse-Kiang Lt. Ves. One fixed bright light		31 9.3 121 59.	| In 4½ fms., S.W. end of Tungsha Banks. A gun .. | .. | .. | .. | 1855

KAMCHATKA

AVATCHKA GULF

DALNI One fixed br. light	52 52.8 158 47.	E. side of entrance .....	.. | 449 | 24 | 1851
BABOUSHKIN PT. One fixed br. light	52 54.7 158 42.6	On second Point, W. side of entrance .....	.. | 294 | 19 | ....
RAKOF One fixed br. light.	52 57.5 158 43.6	# mile S. of entrance to Rakovya Harbour .....	.. | 378 | 22 | ....

W. AUSTRALIA.

		Long. E.	
ROTTNEST ISLAND.	32 ° 0'		White tower, 64 feet high, on .. | 197 | 20 | 1850
One rev. br. lt., 1 min.	115 31.2		centre of Island.....

SWAN RIVER

One fixed bright light 115 45.1

KING GEORGE SOUND.

BREAKSEA ID. | 35 | 4.3 | 1,200 yards, with E. end | .. | 384 | 24 | 1858
 One fixed br. light | 118 | 3.3 |

PRINCE ROYAL HARVEY

PRINCE ROYAL HARR. 33 2.0 Point King, N. entrance 3a 37 10 1800
One fixed bright lt. 117 55.2

Name and Character of Light.	Lat. S. Long. E. ° °	Description, &c.	Apparatus of Apparatus	Height above H. W.	Visible in Miles.	Year established.
BORDA, or FLINDERS CAPE Onerev.br.& red lt., $\frac{1}{2}$ m.	35 45.3 136 38.	N.W. Point of Kangaroo Id. Alternately bright and red ..	•	510 15	30 15	1858
ST. VINCENT GULF						
TROUBRIDGE SHOAL One intermit. br. lt.	37 5.8 137 12.	Centre of Id. Bright 24 secs., dark 36 secs.	2b	80	16	1856
PORT ADELAIDE Lt. V. Two fixed br. lights	34 47. 138 30.	In 5 fathoms, 1 mile S.W. of Bar	•	38 29	10	1849
Lefevre's Peninsula One fixed red light	34 50. 138 31.	End of Jetty. Pilot Station ..	..	..	3	1860
Glenelg Jetty One fixed red, & abr. lt.	34 59.5 138 33.	Outer Jetty. Lights vertical. For Mail Steamers .....	..	29 20	6	1859
STURT	35 51.6 138 10.8	White tower, 75 feet high, on S.E. Point of Kangaroo Id...	•	295	24	1852
CAPE NORTHUM- BERLAND One rev. br., red, and green lt., 1 min.	38 3. 140 37.7	Bright, red, and green, alter- nately	•	123 15 8	18	1859
C. BRIDgewater One fixed bright light	38 22. 141 19.	Building (1861). ....	..	..	..	....
PORTLAND BAY One fixed red, & 1 green light	38 22. 141 39.	Red light on Observatory Hill; green light on Old Jetty	4a	116 4	13	1859
Port Fairy One fixed & flash. red lt.	38 24. 142 20.	S.E. part of Rabbit Island Br. (?) with red flash every 4 m.	4d	41	9	1859
WARRNAMBOOL, or LADY BAY One fixed br., & 1 red lt.	38 26. 142 33.	Br. lt. on centre of Middle Id. Red Harb. lt. at Head of Bay	4a ..	78 ..	13 ..	1859 1860
BASS STRAIT						
CAPE OTWAY One rev. br. lt., 1 m.	38 51. 143 33.	White tower, 52 feet high, on S.W. extremity	•	300	24	1848
KING ISLAND One fixed br. light	39 35. 143 57.	Proposed (1861), on N. Point, C. Wickham	•	300	24	....
PORT PHILIP						
SHORTLAND BLUFF One fixed red, & One bright light	38 16.5 144 43.3	2 m. within entrance, S.W. by S. and N.E. by N., 223 yds. apart	.. ..	109 80	16 10	1842 1854
Swan Spit One fixed red light	.....	On Piles, in 15 feet, on S.W. end of Spit. Gong .....	..	..	8	1860
W. Channel Lt. Ves. Two fixed bright lts.	.....	In 3 fathoms, at N.E. end of W. Channel. Fog bell ....	..	50	9	1854
Geelong Lt. Vessel One fixed bright lt.	.....	In 2 fms., near Bird Rock, Corio Harb. 2 red lts., shown if Lt. Vessel breaks adrift .....	..	27	7	1857

VICTORIA AND Lighthouses. NEW S. WALES. 100

VISIBLE IN MILES.	YEAR ESTABLISHED.	Name and Character of Light.	LAT. S. LONG. E. ° ,'	Description, &c.	Description of Apparatus	HEIGHT ABOVE H. W. IN MILES.	VISIBLE IN MILES.	YEAR ESTABLISHED.
BASS STRAIT								
PORT PHILIP								
30 16	1858	Geelong Pier Head	.....	Fixed bright light .....	...	..	3	1857
0 16	1858	MELBOURNE LT. VES. One rev. bright lt.	37 53. 144 55.3	In 4½ fathoms, off Gellibrand Point .....	..	40	10	1859
8 9	10	Sandridge	.....	Red light on Jetty; green lt. on Rwy. Pier .....	..	..	3	1857
..	3	Williamstown	.....	Red light on old Jetty .....	..	..	3	1857
29 20	6	CAPE SCHANK	38 10. 144 54.	On S. extremity. Flash every 2 min.	1d	238	23	1859
95 24	24	One fixed & flash. lt.	.....	.....	.....	.....	.....	1852
23 15 5	1859	WILSON PROMON.	39 8. 146 23.	On S.E. part	1a	342	24	1859
116 4	13	One fixed bright lt.	.....	.....	.....	.....	.....	1859
DEAL ISLAND	39 29.	Port Albert	38 46. 146 38.	E. part of Latrobe Island, Corner Inlet	4d	40	9	1859
..	..	One rev. br. lt., 1½ m.	147 21.6	On summit of S.W. side (often hidden by fogs).	●	950	36	1846
41 9	1859	CAPE HOWE	37 35. 149 56.2	On Gabo Id., 5½ miles S.W. of Cape. (A new tower building (1861) on S.E. Pt. of Id.). ..	1a	179	17	1856
78 ..	13 ..	JERVIS BAY	35 9.3 150 47.1	2 m. N. of Cape St. George. Br., red, and green alternately.... green light, ½ min.	1b	224	18	1860
PORT JACKSON								
300 300	24	S. HEAD One rev. br. lt., 1½ m.	33 51.2 151 19.8	Macquarie Tower	●	344	21	1817
109 80	16 10	HORNBY One fixed bright lt.	33 50.7 151 18.7	Inner S. Head	●	90	14	1858
..	8	Sow & Pigs Shoal Lt.V. Two fixed bright lts.	33 50.1 151 19.	In 22 feet, on N.W. edge of Shoal. Lights vertical ....	..	26	6	1836
50	9	Fort Denison	.....	Fixed red light on Tower.....	..	..	..	1858
27	7	NEWCASTLE, or PORT HUNTER One fixed bright light	32 55.3 151 48.8	Nobby Head	●	..	30	1858
..	..	MORETON BAY One rev. br. lt., 1 min.	27 2.3 153 28.6	White tower, 70 feet high, on N.E. Point of Moreton Id. ..	●	382	26	1857

110 TASMANIA, AND Lighthouses. NEW ZEALAND.

Name and Character of Light.	Lat. S. Long. E. o /	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
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TASMANIA.**BANKS STRAIT**

GOOSE ISLAND One fixed bright lt.	40 18.7 147 48.	Red and wh. tower, 74 ft. high. Chappel Id., near S. Point ..	1a 135 20 1846
SWAN ISLAND One rev. br. lt., 1 m.	40 44. 148 9.	Red and white tower, 74 feet high, on N. Point	1b | 110 | 14 | 1845
DALRYMPLE PORT One rev. br. lt., 1½ m.	41 3.4 146 48.3	Low Head, E. entrance to Tamar River .....	● | 142 | 15 | ....
D'ENTRECASTEAUX CHAN. One rev. br. lt., 1½ m.	43 29. 147 8.	Cape Bruny, S.W. Point .....	● | 335 | 22 | 1838
HOBARTON One fixed bright light	43 3. 147 33.	Red tower, 40 ft. high, on Iron Pot Id., Mouth of R. Derwent |	a | 65 | 14 | ....

NEW ZEALAND.

PORT NICHOLSON One fixed bright light	41 22. 174 51.2	Cook Strait, N. Island. Pen- carrow Head, Wellington ..	2a | 420 | 30 | 1859
Nelson Harbour One fixed red light	41 16. 173 17.5	Middle Island. Entrance of Harbour .....	.. | .. | .. | 1852
OTAGO One fixed bright light	45 47. 170 44.8	Middle Island. Tairoa Head..	.. 244 10 1850

Value in Miles.	Year established.
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20 | 1846

14 | 1845

15 |

22 | 1838

14 |

30 | 1850

.. | 1852

10 | 1850

Name and Character of Light.	Lat. N. Long. W. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year erected				
BELLE ISLE One fixed bright light	51 53. 55 22.3	White tower, 62 feet high, on S. Point of Id., Straits of Belle Isle. Gun in fog	1a	470	28	1856				
AMOUR POINT One fixed bright light	51 27.6 56 50.9	White tower, 106 feet high, on the Pt. S.E. side of Forteau Bay. Whistle or gun in fog	2a	165	16	1858				
OFFER WADHAM ISLAND One fixed bright light	49 36. 53 46.	Circular brick Tower, on the Island	a	96	12	1858				
CAPE BONAVISTA One rev. lt., br. and red alternately, 2 min.	48 42. 53 8.	Tower, 36 feet high, striped red and white vertically, on Cape. (Lt. apparatus from Bell Rock, E. of Scotland.)	●	140	30	1843				
GREEN ISLAND One fixed bright light	48 30.7 53 6.3	S. side of Catalina Harbour, in Trinity Bay	●	86	15	1857				
BACALHAO, or BAC-CALIEU ID. One rev. br. lt., 20 s.	48 9. 52 48.7	On N. end of Island. Holophotal apparatus	1b	300	30	1858				
HARBOUR GRACE One fixed bright light Two fixed lts. on Beach beacon	47 42.7 53 9.3	One light on Id. at entrance, 4 miles from the town. 2 lts., 11 yds. apart, on Point of Beach Entrance	●	150	20	1836	●	60	10	1853
ST. JOHN'S One fixed bright light	47 33.8 52 39.9	On Fort Amherst, S. entrance of Harbour. Gun in fog	4a	110	12	1852				
CAPE SPEAR One rev. br. lt., 1 min.	47 39.9 52 36.7	Square tower, 38 ft. high, striped red and white horizontally, on Cape	●	275	30	1835				
CAPE RACE One fixed bright light	46 39.3 53 2.6	Tower on Cape, with S.E. side striped red and white vertically	..	180	17	1856				
CAPE PINE One rev. br. lt., $\frac{1}{2}$ min.	46 37.1 53 31.8	Round iron tower, 56 feet high, with red and white bands, on the Cape	●	314	30	1851				
CAPE ST. MARY One rev. lt., br. and red alternately, 1 min.	46 49.4 54 9.5	Light building (1861)	1b	..	..	....	
GREAT BURIN ID. One rev. br. lt., 20 secs.	47 1.5 55 5.	On Dodding Head	2b	410	30	1858				
ST. PIERRE ID. Two fixed bright lights	46 45.5 56 6.9	(French). One on Galantry Hd.; the other on Canon Point, St. Pierre Harb., from May to Decr.	2a	210	18	●	..	3

Gulf of St. Lawrence.

ST. PAUL ID. One fixed br. lt., N. end One br. rev. lt. 1 min., on S.W. Point	47 13.8 60 8.3	Fixed lt., on a Rock; revol. light on S.W. Point. At the latter a fog bell and gun .....	..	144	20	1839
MAGDALEN IDS.	47 50.9 61 9.2	Light on Bird Rocks, proposed (1861) .....	..	..	..	....

112 BRITISH AMERICA. Lighthouses. Gulf of St. Lawrence.

Name and Character of Light.	Lat. N. Long. W. o ,	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
CAPE ROZIER One fixed bright light	48 51.6 64 12.	White tower, 112 feet high, on the Cape	1a	136 | 20		1858
ANTICOSTI ID.						
HEATH POINT One fixed bright lt.	49 5.3 61 41.8	Grey conical tower, 90 ft. high; from April to December.....	●	110 | 15		1831
S.W. POINT One rev. br. lt., 1 m.	49 23.7 63 35.8	Conical grey tower, 75 feet high	●	100 | 15		1831
W. POINT One fixed bright lt.	49 52.5 64 32.	Round white tower, 109 feet high	2a	112 | 15		1858
POINT DE MONTS One fixed bright light	49 19.6 67 22.	Round white tower, 75 feet high, 1½ mile N.E. of Point .....	..	100 | 15		1830

River St. Lawrence.

FATHER POINT One fixed red light	48 31.4 68 27.4	Rimousky. From April 10 to December 10 .....	..	43 | 10		1859
BICQUETTE ID. One rev. br. lt., 2 min.	48 25.2 68 53.5	On W. Point. Hour gun, during fogs and snow .....	..	112 | 15		1844
RED ISLET BANK One fixed red light	48 4.3 69 33.1	On S.W. Point .....	..	75 | 12		1848
GREEN ISLAND One fixed bright light	48 3.3 69 25.2	On N. Point. From April 15 to December 10 .....	..	60 | 13		1809
STH. TRAVERSE LT. VESS. Two fixed bright lts.	47 22.2 70 15.1	N.E. part of St. Rocque Shoals .....	..	.. | 9		1830
STONE PILLAR One rev. br. lt., 1½ min.	47 12.4 70 21.8	100 yards from S. Point of Islet. From April 15 to December 15 .....	..	68 | 13		1843

Note.—The Lights on the upper part of the River St. Lawrence, and those on the Great American Lakes are omitted, as not being of service to oversea vessels.

Visible H. W. above H. W.	Miles.	Year established.
6 | 20 | 1858		

10 | 15 | 1831

00 | 15 | 1831

112 | 15 | 1858

100 | 15 | 1830

43 | 10 | 1859

112 | 15 | 1844

75 | 12 | 1848

60 | 13 | 1809

.. | 9 | 1830

68 | 13 | 1843

and those
service to**BRITISH AMERICA. Lighthouses. NEW BRUNSWICK, &c. 113**

Name and Character of Light.	Lat. N. Long. W. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.

NEW BRUNSWICK.

MISCOU ISLAND One fixed red light	48 1. 64 29.5	White tower, on Birch Point ..	..	79 | 12 | 1856		
MIRAMACHI BAY One fixed bright lt.	47 4.5 64 47.6	White tower, on Escumenac Point	●	70 | 14 | 1841		
Shediac One fixed light	46 14.6 64 31.5	A lantern, on Chene Wharf, in the Summer.....	..	15 | 6 | 1860		

NOVA SCOTIA.

PICTOU HARBOUR One fixed br. lt., and one red light	45 41.4 62 39.5	Tower, str. red and white, ver- tical. S. Point of entrance. Lower light red	●	65 | 11 | 1834		
PICTOU ISLAND One fixed bright lt.	45 49.8 62 30.2	White tower, on E. Point.....	..	62 | 12 | 1853		

CANSO GUT

N. ENTRANCE One fixed bright lt.	45 41.7 61 28.9	White tower, on W. side, 120 yards in shore	●	110 | 18 | 1842		
S. ENTRANCE Two fixed bright lts.	45 31.5 61 14.6	Tower white, with black dia- mond, on Eddy Point, 8 yds. apart .....	..	25 | 8 | 1851		

Prince Edward Island.

Bedeque Harbour One fixed bright light	46 23.5 63 47.5	A lantern, on Green's Wharf, when practicable .....	..	15 | 7 | 1856		
Charlotte Town One fixed bright light	46 11.6 63 7.4	Blockhouse Pt., W. side of en- trance to Harbour .....	..	35 | 9 | 1856		
HILLSBORO' BAY One fixed bright light	46 3.2 63 2.1	White brick tower, on Prim Pt., S.E. of Bay	●	68 | 13 | 1845		
CARDIGAN BAY One fixed bright light	46 8.8 62 27.7	On Panmure Head, S. entrance of Georgetown Harbour	●	89 | 14 | 1853		
Richmond Bay One fixed bright light	46 34.7 63 42.8	On Bill Hook, or Fishing Id., N. entrance .....	..	20 | 8 | 1856		
Cascumpeque One fixed bright light	46 48.4 62 2.1	White tower, on Sandy Island, on N. side	●	32 | 8 | 1856		

Breton Island.

PORT HOOD One fixed br. or red lt.	46 0. 61 31.6	White tower, S. entrance. Light red to N., and br. to S. .....	..	54 | 10 | 1854		

Note.—The lighthouses of Nova Scotia and New Brunswick, where necessary, are painted with black or red stripes, &c., to distinguish the towers from the land; as, after the snow is gone off the land, the accumulations against the fences, which generally run at right angles to the coast, and which continue for some time after it has disappeared from the fields themselves, have exactly the appearance of a white tower, and frequently mislead even those acquainted with the coasts.

Name and Character of Light.	Lat. N. Long. W. ° ,'	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
SEA WOLF, or MARGARIE ISLAND One fixed bright lt.	46 21.5 61 15.5	White tower, on Summit, or Middle of Island.....,.....	..	298 | 21		1854
SYDNEY One fixed bright light	46 16.2 60 7.3	Tower, red and white, vert. Flat Point, E. side of Spanish Bay	●	70 | 14		1832
FLINT ISLAND One revolving light	46 11. 59 45.8	Flash every 15 secs. .....	..	65 | 12		1856
SCATARI ID. One rev. bright light	46 2.2 59 40.3	White tower, on Trap Rock, N.E. Pt. Bright, 1 min.; dark, $\frac{1}{2}$ m.	●	90 | 15		1839
LOUISBURG One fixed bright light	45 54.6 59 57.2	Tower, wh., with bl. vort. stripe on S.E. Point of entrance ....	..	85 | 16		1842

NOVA SCOTIA.

Guysboro Harbour One fixed bright light	45 22.8 61 29.1	W. side of entrance; near Peart Point, Chedabuctoo Bay	●	30 | 8		1846
Arichat Harbour One fixed bright light	45 29. 61 1.8.	Tower, white, S. entrance; on Marache Pt., Madame Island	..	34 | 8		1851
CAPE CANSO Two fixed bright lts.	45 19.8 60 55.4	In one tower; str. red and white horiz.: on N. part of Cran- berry Island	●	75 | 15 40 | 9		1815
WHITE HEAD ID. Revolving lt., 20 secs.	45 12. 61 8.	White tower, on S.W. extremity	..	55 | 11		1853
BEAVER IDS. One rev. br. lt., 2 min.	44 49.6 62 20.2	Tower, white, with 2 black balls, on S.E. part of E. Beaver, or William Island	●	70 | 12		1846
HALIFAX						
Devil Island One fixed red light	44 34.8 63 27.9	Tower, red, with white belt, at E. entrance .....	..	45 | 8		1852
Sherbrook Tower One fixed bright light	44 36.6 63 31.9	Tower, white, with red roof, on Mauger Beach, E. side of entr.	..	58 | 10		1815
SAMBRO ID. One fixed bright light	44 26.2 63 33.6	White tower, on middle of Id.	..	115 | 20		1758
MALAGUASH, or LU- NENBURG BAY One rev. light, 1 min. One fixed bright light	44 20. 64 7.	Tower, red. Upper lt. br. 45 secs., dark 15 secs.; 33 feet above lower light	●	90 | 14 66 | 8		1832
CAPE LE HEVE One rev. lt., $\frac{1}{2}$ min.	44 15.7 64 16.5	White tower, on S. side of Ironbound Island .....	..	70 | 13		1855
METWAY, or MEDWAY HEAD One fixed bright lt.	44 6. 64 34.	Tower, white, with black square, on W. side of entrance .....	..	44 | 10		1851
LIVERPOOL BAY						
COFFIN ISLAND One rev. br. lt., 2m.	44 3. 64 36.	Tower, striped red and white horizontally, on S. Point ....	..	80 | 16		1812
Fort Point One fixed bright lt.	44 3.7 64 39.	White tower, on Fort Point....	..	30 | 7		1855

Name and Character of Light.	Lat. N. Long. W. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
RUGGED ISLAND HARB. One fixed bright light	43 36. 65 6.	White tower, on the Gull Rock	..	51	10	1853
SHELBURNE Two fixed bright lts.	43 37.5 65 16.5	Tower, striped bl. and wh. ver- tically, on Cape Roseway, Mac- nut Id. Lts. vert., 38 ft. apart	.. ..	100 62	18 10	1858
PORT LATOUR One rev. lt., 40 secs.	43 26.9 65 28.7	Tower, white, with black ball, on Baccaro Point, E. side ....	..	49	12	1850
Pubnico Harbour One fixed red light	43 35.7 65 47.	White tower, on Beach Point, S.E. side of entrance .....	..	28	8	1854

Bay of Fundy.

30 | 8 | 1846	SEAL ISLAND One fixed bright light	43 23.6 66 1.3	White tower, $\frac{1}{2}$ mile inland of S. Point .....	● | 98 | 18 | 1830
34 | 8 | 1851	YARMOUTH, or CAPE FOURCHU One rev. br. Lt., 1 $\frac{1}{2}$ m.	43 47.5 66 9.8	Tower, striped red and white vertically, on S. Point of E. Cape .....	● | 117 | 20 | 1839
75 | 15 | 1815 40 | 9 |	BRYER ISLAND One fixed bright light	44 14.9 66 23.5	White tower, on W. Point ....	● | 66 | 15 | 1832
55 | 11 | 1853	PETER ISLAND Two fixed bright lights	44 15.5 66 20.9	White tower, S. entrance to Grand Passage. Lts. horizontal	.. | 40 | 10 | 1850
70 | 12 | 1846	DIGBY, or ANNAPO- LIS	44 40.8 66 47.3	Tower, striped vertically, on S. Point of entrance .....	● | 76 | 13 | 1817
45 | 8 | 1852	Marshall Cove, or Port Williams One fix.br.(or green) lt.	44 56.8 65 16.	Appears <i>green</i> within four miles ..	.. | .. | 5 | 1869
58 | 10 | 1815	Margaretville One fixed br. (or red) lt.	45 3. 65 4.	Appears <i>red</i> within four miles ..	.. | .. | 5 | 1859
115 | 20 | 1758	BLACK ROCK POINT One fixed bright light	45 10.8 64 48.	White tower, on S. Shore.....	.. | 45 | 12 | 1848
90 | 14 | 1832 56 | 8 |	HORTON One fixed bright light	45 6.3 64 2.	White tower, on the Bluff ....	.. | 95 | 20 | 1851
70 | 13 | 1855	BASON OF MINES One fixed bright light	45 18.3 63 46.9	White tower, on Burnt Coat Head .....	.. | 75 | 13 | 1859
44 | 10 | 1861	Parsborough One fixed bright light	45 23. 64 8.	White tower, on Partridge Id., on W. side of River .....	.. | 30 | 9 | 1852
80 | 16 | 1812	APPLE RIVER Two fixed bright Its.	45 26. 64 50.	White tower, on Cape Capstan. Horizontal lights, 24 ft. apart	.. | 40 | 10 | 1848
30 7 1855	GRINDSTONE ISLAND One fixed bright light	45 43.2 64 37.4	White tower, on W. part of Island 60 12 1859

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Name and Character of Light.	Lat. N. Long. W. ° °	Description, &c.	Description of Apparatus	Height above H.W.	Visible in Miles.	Year established.
CAPE ENRAGEÉ One fixed bright light	45 36. 64 46.7	Square white tower, on the Cape	•	151	15	1840
QUACO One rev. br. lt., 20 secs.	45 19.6 65 31.9	Tower, red and white horizontal bands, on Rock off the Head	..	70	15	1848
ST. JOHN'S HARB.						
PARTIDGE ISLAND One fixed bright lt.	45 14. 66 3.5	Tower, striped vertically red and white. Steam whistle every min. in fogs. Bell buoy near	•	119	20	1882
Beacon Tower One fixed bright light	.....	Striped vertically, white and red	•	35	10	1828
LEPREAU Two fixed bright lights	45 3.8 66 27.1	Tower, striped horizontally, red and white lts. vert., 28 ft. apart	..	81 53	15	1831
CAMPOBELLO ID. One fixed bright light	44 57.7 66 53.9	Tower, white, with red cross, on N. Point	•	64	15	1829
PORT ST. ANDREW One fixed bright light	45 4.2 67 4.	N. Point of entrance .....	..	35	10	1833
GREAT MANAN ID. One fixed bright light	44 45.7 66 44.	Swallow's Tail, N.E. part, build- ing, 1861 .....	..	148	17	....
MACHIAS ISLANDS Two fixed bright lights	44 30. 67 5.5	On E. Id. Gun in fogs. Lts. E.S.E. and W.N.W., 55 yards apart	..	58 54	15	1832
GANNET ROCK One rev. light, 20 secs.	44 30.7 66 46.8	Tower, half blk. half wh., vertic., on S. part. Flash every 20 secs.	..	66	12	1831

Above H. W. in Miles.	Visible in Miles.	Year established.
51 | 15 | 1840		
70 | 15 | 1848		
19 | 20 | 1832		
35 | 10 | 1828		
81 | 53 | 15 | 1831		
64 15 1829		
35 10 1833		
148 17 		
58 54 15 1832		
66 12 1831		

UNITED STATES.

LIGHTHOUSES.

MAINE.

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Name and Character of Light.	Lat. N. Long. W. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
WEST QUODDY HEAD One fixed bright lt.	44 49. 66 57.	Near East Port, S. side. Fog bell	3a	133 | 17	1808	
LITTLE RIVER One fixed and flash lt.	44 39.4 67 10.6	On Island, at entrance. Flash every 1½ min.	5d	40 | 12	1855	
Round Island .....	.....	In Machias Bay. Proposed (1861) .....	...	...	...	....
LIBBY ISLAND One fixed bright light	44 34.1 67 21.2	In Machias Bay. Grey tower, 35 feet high. Fog bell	4a	62 | 13	1856	
MOOSE PEAK One rev. br. lt., 30 s.	44 28.9 67 31.7	White tower, 40 feet high, on Mistake Island	2b	65 | 14	1856	
NASHES ISLAND One fixed & flash. red lt.	44 28.7 67 44.5	E. side of Pleasant River	4d	47 | 12	1858	
NARRAGAUGUS One fixed bright light	44 29.4 67 49.5	Red tower, 29 feet high, on S.E. Point of Pond Island	5a	45 | 12	1856	
PETIT MANAN One fixed and flash. lt.	44 22. 67 52.	Grey tower, 109 feet high, on S. end of Island	2d	125 | 17	1855	
WINTER HARBOUR One fixed bright light	44 21.8 68 5.6	On S. Point of Mark Island. Frenchman Bay	5a	37 | 11	1856	
MOUNT DESERT One fixed bright light	43 59.5 68 4.7	Grey tower, 60 feet high, on the Rock. Fog bell	3a	75 | 14	1857	
BAKER'S ISLAND One fixed and flash. lt.	44 15.7 68 14.2	Off Mount Desert Id., Frenchman's Bay. Flash every 1½ m.	4d	105 | 17	1855	
BEAR ISLAND One fixed bright light	44 19. 68 17.5	Cranberry Islands	5a	97 | 15	1856	
BASS HARBOUR HEAD One fixed and flash. red light	44 16.5 68 23.6	E. side .....	...	56 | 13	1858	
Spoon Island .....	.....	Isle au Haut Bay. Building, 1861 .....	...	...	...	....
PENOBSCOT BAY						
FLY, or GREEN ID. One fixed bright lt.	44 15.8 68 27.7	Edgemoggin Reach. On S.E. Point	4a	26 | 9	1856	
SADDLEBACK LEDGE One fixed bright lt.	41 1.8 68 43.8	S.W. end of Isle au Haut Island	5a	61 | 13	1856	
HERON NECK One fixed and flash. red light	44 2.2 68 51.	S. Point of Green Island	5d	92 | 10	1853	
Widow Island .....	.....	Proposed (1861) .....	...	...	...	....
DEER ISLAND One fixed bright lt.	44 9.2 68 41.5	Mark Island, Isle au Haut Bay	4a	62 | 12	1857	
EAGLE ISLAND One fixed bright lt.	44 13.2 68 45.	On Point of Island, Isle au Haut Bay	4a	106 | 16	1837	
Pumpkin Island One fixed bright lt.	44 19. 68 45.	Guide to Buck Harbour	5a	27 | 9	1854	

Name and Character of Light.	Lat. N. Long. W. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles	Year established.
PENOBSCOT BAY						
MATINICUS ROCK Two fixed br. lts.	43 51.2 68 48.	N.N.W. and S.S.E., 60 yards apart. Fog bell	3a	85 90	15	1857
WHITEHEAD ISLAND One fixed bright lt.	44 0.3 69 6.	Fog bell	3a	70	13	1856
OWL'S HEAD One fixed bright lt.	44 6.2 69 1.	W. entrance. Fog bell.....	4a	100	16	1856
BROWN'S HEAD One fixed bright lt.	44 6.5 68 54.	S. Head of Fox Island	5a	39	12	1856
NEGRO ISLAND One fixed bright lt.	44 11.7 69 0.4	S. side of entrance to Camden Harbour	4a	52	12	1856
GRINDELS POINT One fixed bright lt.	44 16. 68 53.3	N. side of Gilkey Harbour, Long Island	5a	39	11	1856
DICE'S HEAD One fixed bright lt.	44 23.4 68 48.3	Near Castine, W. side of entrance	4a	130	17	1858
FORT POINT One fixed bright lt.	44 28.3 68 48.7	Entrance of Penobscot River ..	4a	103	16	1857
TENANT HARBOUR One rev. br. lt., 1 min.	43 58.7 69 10.7	N.E. side of S. Island	5a	66	13	1857
MARSHALL'S POINT One fixed bright light	43 55.6 69 14.7	Entrance to Herring-gut Harb.	5a	31	10	1857
MANHEIGIN ISLAND One rev. br. lt., 1 min.	43 46.3 69 18.4	Fog bell, on Manana Island....	2a	175	19	1856
FRANKLIN ISLAND One fixed and flash. lt.	43 55. 69 23.3	N. end of Island, W. of entrance to St. George's River.....	4d	54	12	1855
PENMAQUID POINT One fixed bright light	43 50.4 69 28.5	S.W. entrance to Bristol Bay ..	4a	75	14	1857
BURNT ISLAND One fixed br. light	43 49. 69 37.1	W. side of Townsend Harbour..	4a	61	13	1858
HENDRICK'S HEAD One rev. br. lt., $\frac{1}{2}$ min.	43 51.2 69 40.5	E. side of Sheepscot River.....	4b	40	12	1851
POND ISLAND One fixed bright light	43 44.1 69 46.	W. entrance of Kennebec River. Fog bell	5a	54	13	1855
SEGUIN ISLAND One fixed bright light	43 42.4 69 45.2	Off Kennebec River. Fog bell	1a	180	20	1857
PORTLAND, or CASCO BAY						
C. ELIZABETH One rev. br. lt., 1 m.	43 33.9 70 11.7	300 yards apart. Fog bell	2b	143 143	17	1858
PORTLAND HARBOUR One fixed br. light	43 37.4 70 12.6	On the Head, S. side. Fog bell	4a	81	14	1855
Breakwater	.....	Red light on N.E. part	6a	23	8	1855
WOOD ISLAND One rev. red lt., 1 min.	43 27.4 70 19.4	Near Saco Harbour	4b	62	13	1858

UNITED STATES. Lighthouses. NEW HAMPSHIRE, &c. 119

Name and Character of Light.	Lat. N. Long. W. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
GOAT ISLAND One fixed bright light	43 20. 70 28.2	N. side; Mouth of Cape Porpoise Harbour	5a	38	11	1833 1857
BOON ISLAND One fixed bright light	43 7.3 70 28.7	W. part; off York Harbour....	2a	133	17	1812 1854
NEW HAMPSHIRE.						
WHALE'S BACK One fixed and flash lt.	43 3.5 70 42.1	N.E. side of Portsmouth Harbour. Flash every 1½ min...	4d	68	12	1829 1855
PORTSMOUTH One fixed bright light	43 4.2 70 42.8	S.W. side of Inner entrance of Harbour	4a	70	14	1804 1854
WHITE ISLAND One rev. br. lt., ½ min.	42 58. 70 38.2	S.W. Id. of Isle of Shoals.....	2b	87	15	1821 1858
MASSACHUSETTS.						
NEWBURY PORT Two fixed bright lts.	42 48.4 70 49.3	S. side of entrance to Port, Merrimack River, 167 yds. apart	5a	54 20	13 5	1809 1857
IPSWICH HARBOUR One fixed & flash lt., & One fixed bright light	42 41.1 70 46.2	Flash every 1½ min. Lts. E. ½ S., and W. ½ N., 173 yds. apart	5d 6a	40 20	12	1837 1856
Wigwam Point One fixed bright light	42 39.7 70 41.2	E. of entrance to Annisquam Harbour	5a	50	12	1801 1857
Straitsmouth Harbour One fixed bright light	42 39.7 70 35.5	On Island, N. of Cape Ann	6a	33	11	1850 1857
CAPE ANN Two fixed bright lights	42 38.3 70 34.6	On Thatcher's Id., N. by E. ¾ E., & S. by W. ¾ W., 298 yds. apart	..	98	16	1841 1849
GLOUCESTER HARBOUR One fixed bright light	42 34.6 70 40.1	On the Point, E. side. Fog bell	4a	60	13	1837 1857
TEN POUND ISLAND One fixed bright light	42 36.1 70 40.2	Gloucester, or Cape Ann Harbour	6a	49	12	1831 1856
BAKER'S ISLAND Two fixed bright lights	42 32.2 70 47.5	S. side of N.E. entrance to Salem Harb. 13 yds. apart. Fog bell	4a	87 64	15 13	1797 1857
MARBLEHEAD HARBOUR One fixed bright light	42 30.3 70 51.1	S. side of entrance	6a	43	12	1835 1856
Egg Rock One fixed red light	42 26. 70 54.1	Off Nahant	5a	87	8	1856
BOSTON BAY						
OUTER MINOTS LEDGE One fixed br. lt.	42 16.1 70 45.8	Grey granite tower, on Cohasset Rocks	2a	84	14	1860
BREWSTER ID. One flash. br. lt., ½ m.	42 19.6 70 53.7	N. entrance of Harbour	2c	90	15	1784 1859
W. end of Spit	.....	One fixed red light	6a	35	7	1856
LONG ISLAND HD. One fixed bright light	42 19.8 70 57.7	N.E. end of Island	4a	80	15	1819 1855

Name and Character of Light.	Lat. N. Long. W. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
SCITUATE One fixed bright light	42 12.2 70 43.2	On Cedar Point, N. of entrance	4a	49	12	1812 1855
CAPE COD BAY						
PLYMOUTH Two fixed bright lts.	42 0.2 70 36.3	Gurnet Point, N. side of Harb. N.W. and S.E., 10 yds. apart	6a	93	15	1769 1855
RACE POINT One fixed & flash. It.	42 3.7 70 14.8	N.W. Point of Cape Cod. Flash every 1½ min. Fog bell	4d	35	11	1816 1855
LONG POINT One fixed bright lt.	42 1.9 70 10.3	On Shoal, S.W. entrance to Provincetown Harbour	5a	28	11	1826 1855
Mayo's Beach One fixed bright lt.	41 55.8 70 2.2	Head of Wellfleet Bay	6a	26	6	1838 1855
BILLINGSGATE ISLAND One fixed bright lt.	41 51.6 70 4.9	N. side of entrance to Well- fleet	4a	40	12	1822 1855
SANDY NECK One fixed bright lt.	41 43.3 70 17.1	W. side of entrance to Barn- staple	4a	33	11	1836 1857
CAPE COD HIGH- LANDS One fixed bright light	42 2.3 70 3.9	Cape Truro	1a	195	20	1797 1857
NAUSET BEACH Three fixed bright lts.	41 51.6 69 57.3	At Eastham, E. of Cape Cod; N. and S., 50 yds. apart	6a	93	10	1837 1855
CHATHAM HARBOUR Two fixed bright lights	41 40.3 69 57.2	W. Side; N. and S., 23 yards apart	4a	70	14	1808 1857
MONOMOY POINT One fixed bright light	41 33.6 69 59.8	Cape Malabar, S. end of Cape Cod	4a	33	11	1823 1857
POLLOCK RIP LT. VESS.	.....	One fixed br. lt., off Chatham ..	●	45	12	1849
SHOVELFUL LIGHT VESS. One fixed bright light	41 34. 69 57.6	2½ miles S.S.W. ¼ W., from Monomoy Point	●	40	11	1852
HANDKERCHIEF LT. VESS. One fixed bright light	.....	In 5½ fms., 1½ min. from S. part of Shoal	●	40	10	1855
Bass River One fixed bright light	41 39.1 70 8.3	N. of Vineyard Sound	5a	40	8	1854
BISHOP AND CLERKS SHOAL One rev. br. lt., ½ m.	41 34.3 70 15.9	N. part. Fog bell	4b	59	14	1858
SUCCONNESET SHOAL LT. VESSEL One fixed bright lt.	.....	In 6 fms. Between Succonnesset and Eldridge Shoals. Fog bell and horn	●	40	10	1854
NANTUCKET One fixed bright light	41 23.4 70 3.	White tower, on N.E. Point of Island	3a	70	14	1769 1857
SANKATY HEAD One fixed and flash. light	41 17. 69 58.2	Tower, wh., red, wh., on E. part of Nantucket Island. Flash of 10 secs. every min.	2d	150	20	1849
SOUTH SHOAL LT. VESSEL Two fixed bright lts.	40 56.5 69 52.5	In 14 fms. 2 miles S. of Shoal. Fog bell, horn, and gun	●	44	12	1856

Shore N. W. Visible in Miles.	Year established.
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Name and Character of Light.	Lat. N. Long. W. ° °	Description, &c.	Description of Apparatus	Ht. ft. abv seal	W. Miles.	Year established.
VINEYARD SOUND						
GAYHEAD One flash. br. light	41 30.9 70 50.4	W. Point, Martha's Vineyard Sound. Flash every 10 secs.	1c	170	20	1856
Hyannis Harbour One fixed bright lt.	41 38. 70 18.6	Inside the Harbour	6a	36	8	1856
Tuckanuck Shoal Lt. Vessel One fixed bright lt.	41 26.7 70 17.1	In 8 fms. On Cross Rip, N.W. of Nantucket. Fog bell, and horn	•	39	7	1828 1855
Nantucket Cliff Two fixed bright lts.	.....	On the Beach, N.W. of Harb., N.W. and S.E., 100 yds. apart	..	8 10	4	1838 1856
BRANT One fixed bright lt.	41 17.4 70 5.8	Red tower, on the Point	4a	46	11	1794 1856
Nantucket Harbour One fixed bright lt.	41 16.4 70 5.	From a window, on S.E. side ..	..	24	5	1820 1856
CAPE POGE One fixed bright lt.	41 25.2 70 27.3	N.E. Point of Martha's Vineyard Sound	4a	55	13	1801 1857
EDGARTOWN One fixed bright lt.	41 23.4 70 30.4	W. side of entrance to Harbour	4a	37	12	1828 1856
HOLMES HOLE One fixed bright lt.	41 28.9 70 36.4	W. Chop of Harbour	4a	60	13	1817 1857
NOBSQUE POINT One fixed br. light	41 30.9 70 40.5	E.S.E. of entrance to Wood's Hole Harbour	5a	80	13	1828 1856
TARPAULIN COVE One fixed br. light	41 28.1 70 45.7	W. side	5a	80	13	1817 1856
VINEYARD SOUND Lt. VESSEL Two fixed br. lts.	41 22. 70 57.6	In 13½ fathoms, near Sow and Pigs Rocks	•	34 23	9	1847 1855
BUZZARD'S BAY						
CUTTYHUNK One fixed bright lt.	41 24.8 70 57.3	S.W. Point of Island	5a	42	12	1828 1857
DUMPLING ROCK One fixed bright lt.	41 32.3 70 55.5	Off Round Hill	5a	42	12	1828 1857
CLARK'S POINT One fixed bright lt.	41 35.5 70 54.3	W. side of entrance to New Bedford Harbour	5a	57	12	1800 1856
Palmer's Island One fixed bright lt.	41 37.6 70 54.8	N.E. end, in New Bedford	5a	32	9	1849 1856
NED'S POINT One fixed br. light	41 39. 70 48.	N. side of Mattapoisett Harbour	6a	43	11	1849 1856
BIRD ISLAND One rev. br. lt., 1½ m.	41 40.1 70 43.3	E. side of entrance to Sippican Harbour	5b	35	10	1819 1857
WING'S NECK One fixed bright lt.	.....	Head of Buzzard's Bay, in Sandwich	5a	44	10	1849 1856
Point of Rocks	.....	Building (1861) on W. side of entrance to Westport Harb...	..	..	..	....

Name and Character of Light.	Lat. N. Long. W. o	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
RHODE ISLAND.						
BRENTON'S REEF LIGHT VESSEL	..... Two fixed bright lts.	In 13 fms., E. side of entrance to Newport	•	50 40	12	1853
BEAVER TAIL	41 26.9 One fixed bright light	S. Pt. of Connecticut Id., en- trance to Newport Harbour ..	3a	96 15	15	1793 1856
LIME ROCK	71 24.3 One fixed bright light	S. side of Newport Harbour....	6a	30	11	1854
NARRAGANSETT BAY						
GOAT ISLAND	41 29.6 One fixed bright lt.	On Breakwater, Newport Har- bour	4a	33 11	11	1823 1857
DUTCH ISLAND	41 29.8 One fixed bright lt.	S. end	4a	56 14	14	1826 1857
POPLAR POINT	41 34.2 One fixed bright lt.	Near Wickford	6a	51 12	12	1831 1855
PRUDENCE ISLAND	41 36.4 One fixed bright lt.	East side, on Sandy Point.....	5a	30 10	10	1852
Bristol Ferry	41 38.7 One fixed bright lt.	N. side of entrance to Mount Hope Bay	6a	35 10	10	1855
WARWICK	41 40. One fixed bright lt.	S. end of Neck	4a	54 14	14	1826 1856
NAYAT POINT	41 43.5 One fixed bright lt.	Entrance to Providence River ..	4a	31 12	12	1828 1856
POINT JUDITH	41 21.5 One rev. lt., 15 secs.	S. extremity of Narragansett Shore	4a	67 14	14	1810 1857
BLOCK ISLAND	41 13.4 One fixed bright light	N. Point of entrance to Long Island Sound	4a	65 14	14	1829 1857
WATCH HILL	41 18.2 One fixed bright light	3 miles S.E. of Stonington	4a	62 14	14	1808 1857

CONNECTICUT.**LONG ISLAND SOUND**

STONINGTON	41 19.6 One fixed bright lt.	E. side of entrance	6a	50 12	12	1823 1855
EEL GRASS LT. VESSEL	41 18.4 One fixed bright lt.	On the Shoal	•	32 10	10	1835 1857
MORGAN POINT	41 18.9 One fixed bright lt.	N. side of Fisher's Island Sound	6a	44 11	11	1831 1855
N. DUMPLING ISLAND	41 16. One fixed red light	Fisher's Island Sound. Fog bell	6a	70 12	12	1868 1855
NEW LONDON	41 19. One fixed bright lt.	W. side of entrance to River Thames. Fog whistle	4a	86 14	14	1800 1857
BARTLET'S REEF LT. VS.	41 16. Two fixed bright lts.	On Reef, off New London.....	•	28 35	10	1846 1857

Miles.
Year
established.

UNITED STATES.

LIGHTHOUSES.

CONNECTICUT.

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		Name and Character of Light.	Lat. N. Long. W. o	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
LONG ISLAND SOUND								
12 | 1853		LITTLE GULL ID.	41 12.3 72 6.7	S. side of Long Island Sound. One fixed bright lt.	3a	74	13	1806 1857
				Fog bell				
15 | 1793 1856		Gardiner's Island	.....	Fixed bright light, on N. Point	6a	20	6	1855
11 | 1854		PLUM ISLAND	41 10.4 72 13.6	W. end; N.E. extremity of Long One rev. br. lt., $\frac{1}{2}$ m.	4a	63	12	1827 1856
11 | 1823 1857		Cedar Island	41 2.4 72 15.9	Sag Harbour, Long Island	6a	34	10	1839 1855
14 | 1826 1857		SAYBROOK POINT	41 16.3 72 21.5	W. side of Mouth of Connecticut One fixed bright lt.	4a	80	13	1803 1857
12 | 1831 1855		Calves' Island	.....	2 miles below Essex Town, E. One fixed bright lt.	6a	..	3	1856
10 | 1852		Brockways Reach	.....	Fixed br. lt., 2m. above Essex Tn.	6a	..	3	1856
35 | 10 | 1855		Devil's Wharf	.....	Fixed br. lt., 4m. above Essex Tn.	6a	..	3	1856
54 | 14 | 1826 1856		CORNFIELD PT. LT. VES.	41 13.5 72 23.4	In 7½ fms., on middle of S. side One fixed bright lt.	●	40	10	1856
31 | 12 | 1828 1856		HORTON'S POJNT	41 5. 72 27.3	On the Point	3a	110	18	1857
67 | 14 | 1810 1857		FAULKNER ID.	41 12.7 72 39.5	Off Guilford Harbour. Flash One fixed & flash. lt.	4d	98	15	1801 1856
65 | 14 | 1829 1857		NEW HAVEN HAR.	41 15.9 72 54.5	On Five Mile Point, E. side of One fixed bright lt.	4a	93	15	1805 1855
62 | 14 | 1808 1857		STRATFORD POINT	41 9.1 73 6.5	W. entrance to River.....	4b	53	12	1821 1857
50 | 12 | 1823 1855		STRATFORD PT. LT. VES.	41 4. 73 4.6	In 11 fms., on Middle Ground..	●	32	10	1837 1855
32 | 10 | 1835 1857		Bridgeport	41 10.5 73 11.7	2 miles S.W. by W. of town....	6a	23	6	1851 1854
44 | 11 | 1831 1855		OLD FIELD POINT	40 58.6 73 7.4	S. side of Long Island Sound ..	4a	67	13	1823 1855
70 | 12 | 1868 1855		BLACK ROCK HARB.	41 8.5 73 13.2	On Fairweather Island	5a	52	12	1808 1854
86 | 14 | 1800 1857		EATON'S NECK	40 57.2 73 24.3	E. side of entrance to Huntington One fixed bright lt.	3a	138	17	1798 1857
28 | 10 | 1846 35 | 1857		LLOYD'S HARBOUR	40 54.8 73 26.2	N. side	5a	48	10	1857
		NORWALK ISLAND	41 2.9 73 25.4	W. end; at W. entrance of Nor- walk River	4b	40	11	1826 1857
		ONE REV. red and br. lt., 1½ min.						
		GREAT CAPTAIN ID.	40 58.9 73 37.7	Near Greenwich Point	4a	62	12	1829 1858
		EXECUTION ROCKS	40 52. 73 44.5	Off Sands Point. Fog bell	4a	54	12	1848 1856

Name and Character of Light.	Lat. N. Long. W. ○	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year Established
LONG ISLAND SOUND						
SANDS POINT	40 51.9	E. entrance to Cow Bay	4b	53	15	1809
One rev. br. lt., $\frac{1}{2}$ m.	73 44.1					1856
NEW YORK AND NEW JERSEY						
MONTAUK POINT	41 42	E. end of Long Island. Flash	1d	160	20	1795
One fixed and flash. lt.	71 51.7	every 2 min.....				1860
GREAT WEST, or SHINNECOCK, BAY	40 51.	N. side; tower, 150 ft. high, on	1a	160	20	1857
One fixed bright lt.	73 30.	Pondquogue Point				
FIRE ISLAND	40 37.9	S. side of Long Island. Yellow	1b	166	22	1826
One rev. br. lt., 1 min.	73 13.3	tower, 150 feet high				1858
NEW YORK BAY						
SANDY HOOK Lt.V.	40 28.	6 miles from Sandy Hook and	●	45	10	1823
Two fixed bright lts.	73 52.	Navesink lights				1854
HIGHLANDS OF NAVESINK	40 23.7	S. of Sandy Hook, 100 yards	1	248	21	1823
One fixed br. lt., and	73 59.4	apart	2b			1840
One rev. br. lt., $\frac{1}{2}$ m.						
SANDY HOOK	40 27.6	S. entrance to New York Harb.	3a	90	15	1762
Three fixed br. lts.	74 0.4	E. lt. is N. by W. $\frac{3}{4}$ mile, and	5a	35	10	1857
		W. lt. N.W. $\frac{1}{4}$ m., from main lt.	6a	35	10	
MAIN CHANNEL	40 25.2	One near the Beach, the other on	2a	60	12	1856
Two fixed bright lts.	74 4	Chapel Hill, half mile apart ..	3a	224	12	
GEDNEY'S CHANNEL	40 27.	Near Point Comfort	2a	40	12	1856
Two fixed bright lts.	74 8.2		3a	76	14	
SWASH CHANNEL	40 33.7	On Staten Id.; near Elm Tree	2a	59	14	1856
Two fixed bright lts.	74 6.6	Station, and New Dorp	3a	189	14	
PRINCES BAY	40 30.4	S.E. end of Staten Id. Flash	3d	106	16	1828
One fixed & flash lt.	74 13.	every 2 min.				1857
FORT TOMPKINS	40 35.9	On Staten Island, W. side of	4a	89	15	1839
One fixed bright lt.	74 4.4	Narrows				1855
ROBBINS REEF	40 39.4	N.W. part of New York Har-	4a	66	13	1839
One fixed bright lt.	74 4.2	bour. Fog bell				1855
NEWARK BAY						
BERGEN POINT	.....	On a Reef, at entrance to Newark	6a	40	10	1849
One fixed bright lt.		Bay. Fog bell				1853
CORNER STAKE	.....	Fixed br. lt., opposite Eliz. Port	6a	..	..	1857
PASSAIC RIVER	.....	Fixed br. lt., at Mouth of River	6a	40	10	1849
ELBOW	Fixed br. lt., $\frac{1}{2}$ m. N. of Passaic Lt.	6a	1854

FEB
O
ASS
O
HOG
O

Visible in Miles.	Year established
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15 | 1809
185610 | 1826
185520 | 1795
1860

20 | 20 | 1857

22 | 1826
185810 | 1823
185421 | 1828
184015 | 1762
10 | 1857
10 | 1857

12 | 1856

12 | 1856

14 | 1856

14 | 1856

16 | 1828
185715 | 1839
185513 | 1839
185510 | 1849
1853

... | ... | 1857

10 | 1849

... | ... | 1854

Name and Character of Light	Lat. N. Long. W. ° °	Description, &c.	Distance of American Fish from L. W.	Height above H. W.	Visible in Miles.	Year established
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NEW JERSEY.

BARNEGAT SHOALS One rev. br. lt., 10 secs.	39 45.8 74 6.7	Red and white tower, 150 feet high; S. side of Inlet.....	1b	165	22	1831 1858
ABSECOM One fixed bright light	39 22. 74 25.6	Tower, 150 feet high, on S. side of Inlet.....	1a	167	22	1856
CAPE MAY LT. VES. Two fixed bright lts.	38 53.5 74 39.5	In 12 fathoms, on Five-Fathom Bank, 16 miles from C. May..	•	45 40	10	1830 1853
CAPE MAY One fixed and flash. br. light, 1½ min.	38 55.8 74 57.8	N. side Delaware Bay. (A tower, 150 ft. high, with la rev. br. lt. 1 m., is to replace the present)	1d	84	14	1823 1858
CAPE HENlopen Two fixed bright lights	38 46.6 75 5.4	S. side Delaware Bay. Lower lt. ¼ mile N.W. of Higher	1a	180	20	1792 1855

DELAWARE BAY AND RIVER

BREAKWATER One fixed & flash. lt.	38 47.9 75 6.1	Flash every 45 secs. Fog bell	4d	47	10	1840 1855
BRANDYWINE SHOAL One fixed bright lt.	38 59. 75 7.3	Iron screw pile tower. Fog bell	3a	46	13	1860 1857
Maurice River	.....	Fixed br. lt., S.W. of Haystack Id.	6a	45	10	1840
Egg ISLAND One fixed bright lt.	39 10.5 75 8.6	N. side of Bay.....	5a	45	11	1837 1866
UPPER MIDDLE SHOAL, or CROSS LEDGE, LT. VESSEL	.....	One fixed br. lt., W. side of main Ship Channel. Fog bell and horn	•	39	9	1845 1864
MAHON RIVER One fixed bright lt.	39 10.3 75 23.7	S. side of Bay	5a	30	9	1831 1855
COHANZEEY One fixed bright lt.	39 20.3 75 21.7	W. side of Creek, N. side of Bay	5a	46	11	1838 1855
BOMBAY HOOK One fixed bright lt.	39 21.8 75 30.9	N.W. end	4a	46	11	1831 1855
REEDY ISLAND One fixed bright lt.	39 80. 75 34.4	S. Point. Fog bell	4a	55	12	1839 1855
CHRISTIANA RIVER One fixed bright lt.	39 43.3 75 31.4	At Wilmington, N. side.....	4a	48	11	1835 1855
Fort Mifflin	.....	Fixed br. lt., on Pier. Fog bell	6a	28	7	1849

VIRGINIA.

FENWICK ISLAND One fixed and flash. lt.	38 27. 75 4.1	White brick tower, fixed lt., with flash every 2 min.	3d	86	15	1868
ASSATEAGUE ID. One fixed bright light	37 54.6 75 21.7	Between Chesapeake and Delaware Bays, 2 m. from S.W. Pt.	3a	80	14	1833 1856
HOG ISLAND One fixed bright light	37 23.3 75 42.2	W. Point	4a	60	13	1852 1855

Name and Character of Light.	Lat. N. Long. W. ○ ,	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
CHESAPEAKE BAY						
CAPE CHARLES One rev. br. lt., 1 m.	37 7.8 75 52.8	N.E. of Smith Id., N. entrance. (A new tower, 150 ft. high, building.)	1b	69	14	1827 1858
CAPE HENRY One fixed br. light	56 55.5 76 0.8	S. side of entrance	2a	129	17	1791 1857
HAMPTON ROADS WILLOUGHBY SPIT LT. VESSEL Two fixed br. lts.	.....	S. of entrance to Hampton Roads	●	48 35	11	1847 1857
OLD PT. COMFORT Two fixed br. lts.	37 0. 76 18.7	One on N. side of entrance to James' River; the other on S.W. Point	4a 6a	48 21	11 5	1802 1855
CRANEY ISLAND SHOAL One fixed bright lt.	.....	W. side of entrance to Elizabeth River, near Norfolk. Fog bell and horn	5a	52	12	1820 1859
Naval Hospital	.....	Fixed bright light, on the Wharf	6a	..	6	1857
JAMES RIVER						
White Shoal	.....	Fixed br. lt., below Sandy Point	6a	27	9	1854
Point of Shoals	.....	Fixed bright light, on the Shoal	6a	27	9	1854
Deep Water Shoals	Fixed bright light, on the Shoal	6a	27	9	1854
Jordan's Point	Fixed bright light	6a	35	10	1854
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CHERRYSTONE INLET One fixed bright lt.	37 15.5 76 3.	W. side of entrance	4a	36	10	1859
BACK RIVER One rev. br. lt., $\frac{1}{2}$ m.	37 5. 76 21.	S. side of entrance	4b	35	10	1829 1854
York Spit Lt. Vessel	.....	Fixed br. lt., in 4 fms., off Spit	●	40	9	1855
NEW POINT COMFORT One fixed bright lt.	37 18. 76 17.1	N. side of Mobjack Bay	4a	60	13	1804 1855
WOLFRAP SHOALS LT. VESSEL Two fixed br. lts.	.....	E. side of Shoal, between York and Rappahannock Rivers ..	●	30 38	10	1821 1854
Stingray Point One fixed bright lt.	37 33.6 76 14.7	S. side of Rappahannock River	6a	36	7	1859
WINDMILL PT. LT. VES. One fixed bright lt.	.....	S.E. part of Shoal, N. side of Rappahannock River	●	34	10	1834 1854
WATTS ISLAND One fixed & flash lt.	37 46.9 75 53.8	S. end; E. entrance to Tangier Sound	5d	46	12	1833 1857
<hr/> MARYLAND.						
JANE ISLAND LT. VES. One fixed bright lt.	.....	Off end of Bar, Tangier Sound..	●	30	10	1853

UNITED STATES.

LIGHTHOUSES.

MARYLAND. 127

		Name and Character of Light.	Lat. N. Long. W. ° °	Description, &c.	Description of Apparatus	Height above H. W. in Miles.	Visible in Miles.	Year established.		
CHESAPEAKE BAY AND RIVERS										
14 | 1827 1858		SMITH PT. LIGHT VES. Two fixed bright lts.	.....	S.E. entrance of Potomac River	●	35 39	10	1821 1857	
17 | 1791 1857		FOG POINT One fixed bright lt.	38 2.7 75 2.8	Smith Island, entrance of Po- tomac River	5a	30 10	10	1827 1855		
11 | 1847 1857		CLAY ISLAND One fixed bright lt.	38 13.9 75 58.1	Entrance of Nanticoke River ..	6a	36 10	10	1832 1855		
11 | 1802 5 | 1855		LOOKOUT POINT One fixed bright lt.	38 2.3 76 19.6	N. side of entrance to Potomac River	4a	37 10	10	1831 1857		
12 | 1820 1859		HOOPER'S STRAITS LT. VESSEL One fixed br. lt.	.....	S. of Hooper's Island.....	●	34 10	10	1827 1856	
6 | 1857		COVE POINT One fixed & flash. lt.	38 23.1 76 23.2	4 miles N. of Patuxent River. Flash every 1½ min.	4d	46 11	11	1828 1857		
7 | 9 | 1854		SHARP ISLAND One fixed bright lt.	38 37.7 76 22.5	N. Point; entrance of Choptank River	5a	41 10	10	1838 1855		
7 | 9 | 1854		THOMAS POINT One fixed bright lt.	38 54.4 76 27.6	4 miles S. of entrance to Anna- polis	4a	63 12	12	1825 1857		
7 | 9 | 1854		GREENBURY POINT One fixed bright lt.	38 58.5 76 26.9	N. side of Annapolis Harbour ..	6a	50 11	11	1848 1855		
35 | 10 | 1854		SANDY POINT One fixed & flash. lt.	.....	Flash every 1½ min. Appears as fixed lt. only within 10 miles	5d	50 12	12	1858	
PATAPSCO RIVER										
36 | 10 | 1859		SEVEN FOOT KNOTT One fixed br. light	39 9.3 76 23.9	Entrance to Patapsco River	4a	43 11	11	1855		
35 | 10 | 1829 1854		NORTH POINT Two fixed br. lts.	39 11.6 76 26.2	N. side of entrance	6a	33 42	10 11	1824 1856		
40 | 9 | 1855		FORT CARROLL One fixed br. light	39 11.8 76 26.6	On the Fort. Fog bell	3a	37 10	10	1854		
30 | 13 | 1804 1855		LAZARETTO POINT One fixed br. light	39 15.6 76 34.6	N. side of Baltimore Harbour ..	4a	35 10	10	1831 1855		
30 | 10 | 1821 38 | 10 | 1854		POOLE ISLAND One fixed br. light	39 17.4 76 15.7	Off Gunpowder River. Fog bell	4a	35 10	10	1825 1855		
36 | 7 | 1859		SUSQUEHANNA R.								
34 | 10 | 1834 1854		TURKEY POINT One fixed br. light	39 26.9 76 0.2	N. side of entrance to Elk and Susquehanna Rivers	4a	65 12	12	1833 1855		
46 | 12 | 1833 1857		FISHING BATTERY One fixed br. light	39 29.6 76 4.6	On the Battery	6a	36 10	10	1853		
30 | 10 | 1853		HAVRE DE GRACE One fixed br. light	39 32.4 76 4.8	Concord Point, entrance of Sus- quehanna River	6a	40 10	10	1825 1857		
POTOMAC RIVER										
		PINEY POINT One fixed br. light	38 7.6 76 32.5	E. side, about 14 miles N.W. of Mouth	5a	35 10	10	1836 1856		

Name and Character of Light.	Lat. N. Long. W. ○ ;	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
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POTOMAC RIVER

BLAKISTONE ISLAND One fixed br. light	38 11.3 76 43.	Entrance of Clement Bay	4a	46	11	1851 1856
Lower Cedar Pt. Lt. Vessel One fixed br. lt.	.....	Between Cedar and Yates Points	●	22	8	1825
Upper Cedar Pt. Lt. Vessel One fixed br. lt.	.....	Off the Point, opposite Tobacco River	●	28	10	1851 1856
Fort Washington	.....	Fixed bright light, on the Wharf	6a	..	6	1857
JONES POINT One fixed br. light	38 47.5 77 3.2	Near Alexandria	5a	35	10	1855
Bowler Rock Lt. Vessel	.....	Fixed bright light	●	..	5	1835

NORTH CAROLINA.

BODY'S ISLAND One rev. br. lt., 1½ min.	35 47.3 75 31.3	1½ mile S. of new Inlet	3b	90	15	1857
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CAPE HATTERAS One flash. br. lt., 15 s., and one fixed br. lt.	35 15.2 75 30.5	Flash. light, 2 miles N. of high water; fixed light, 500 yards from Point	1c 6a	150 25	20 6	1798 1857
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PAMLICO SOUND

OCRACOKE ID. One fixed bright lt.	35 6.5 75 58.5	W. end	4a	75	15	1823 1854
ROYAL SHOAL LT. VES.	.....	One fixed br. lt., on S.W. Point	●	43	11	1826
ROYAL SHOAL	.....	Fixed and flash. lt., on N.W. Pt.	4d	33	11	1857
HARBOUR ID. LT. VES.	.....	Br. lt. on Bar, between Pamlico and Core Sds.	●	34	10	1836
BRANT ID. SHOAL LT. V.	.....	Br. light, S. part of Pamlico Sd.	●	45	11	1851
NEUSE R. LT. VESSEL	.....	Bright light, off Marsh Point ..	●	38	11	1828
PAMLICO POINT One fixed bright lt.	35 19.4 76 31.3	S. side of Pamlico River	5a	37	11	1828 1856
LONG SHOAL LT. VES.	.....	Fixed br. lt., on E. Point Bell, &c.	●	46	11	1854
ROANOKE MARSHES One fixed bright lt.	.....	Pile lighthouse, between Pamlico and Croatan Sounds. Fog horn	4a	33	11	1825 1857
ROANOKE ID. LT. VES.	.....	Between Pamlico and Albemarle Sounds. Fog bell and horn..	●	31	10	1835
WADE POINT One fixed bright light	.....	White Pile lighthouse, on end of Shoal, W. side of Pasquotank R., Albemarle Sound	5a	31	10	1855
ROANAKE RIVER LT. VES.	.....	Fixed bright lt., near entrance..	●	41	11	1835
CAPE LOOKOUT One fixed bright light	34 37.3 76 30.7	Red tower, 96 feet high, near the end of Cape	1a	156	22	1812 1859

Miles.	Year established
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UNITED STATES.

LIGHTHOUSES.

N. & S. CAROLINA. 129

Name and Character of Light.	Lat. N. Long. W. ° ,	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established
BOGUE BANKS Two fixed bright lts.	34 41.7 76 40.	Beaufort Harbour, near Fort Macon. In one, N.W. $\frac{1}{2}$ W., and S.E. $\frac{1}{2}$ E., $\frac{1}{2}$ mile apart ..	4a 6a	50 30	13 10	1855
FRYINGPAN SHOALS LT.V. Two fixed bright lights	33 35. 77 50.	In 10 fathoms, 1 mile from Outer Shoal	●	40	12	1854
CAPE FEAR One fixed bright light	33 52.3 77 59.8	White tower, 92 feet high, on Bald Head, E. side of Cape Fear River, 4 m. from Cape ..	3a	107	16	1818 1855
FEDERAL POINT One fixed bright light	33 58.1 77 54.9	N. side of Inlet, N. of entrance of Cape Fear River	4a	46	12	1816 1855
CAPE FEAR RIVER						
OAK ISLAND Two fixed bright lts.	33 53.3 78 1.6	3 m. below Wilmington, N. $\frac{1}{2}$ E., and S. $\frac{1}{2}$ W., 267 yards apart	5a	37 27	9	1849 1855
PRICE'S CREEK Two fixed bright lts.	33 56.1 77 59.2	Entrance of Creek, W. bank of River	6a	25 35	9	1850
HORSE-SHOE LT.V. One fixed bright lt.	33 56.3 77 55.4	Between New Inlet and Price's Creek	●	43	16	1851
Campbell's, or Big. Id. One fixed bright lt.	34 6.9 77 56.	On S.W. corner	6a	25	9	1849 1855
Orton's Point One fixed bright lt.	34 3.4 77 56.2	W. Bank of River	6a	25	9	1849 1855
Upper Jetty Range Two fixed bright lts.	34 12.8 77 56.3	E. side of River, 3 miles below Wilmington, 267 yds apart	6a	42 65	8	1855
SOUTH CAROLINA.						
GEOGETOWN One fixed bright light	33 13.5 79 6.7	White tower, 82 ft. high, at E. entrance to Pedee River	4a	85	14	1801 1854
Fort Point	.....	Fixed bright light	5a	34	9	1858
CAPE ROMAIN One rev. br. lt., 1 min.	33 1.1 79 17.1	Raccoon Key. Striped red and white tower, 160 feet high ..	1b	150	23	1827 1857
BULL'S BAY One fixed bright light	32 55.7 79 30.5	White brick house, N. end of Island	4a	35	11	1852
RATTLESNAKE SHOALS LT. VESSEL Two fixed bright lts.	32 44.1 79 43.6	In 6 fathoms. Opposite N. end of Sullivan Island. Fog horn and bell	●	44	12	1854
CHARLESTON Two fixed bright lights	32 41.9 79 52.5	One on Id., W. of Ship Channel ; the other in front of main lt.	2a 4a	133 50	20 10	1830 1857
CHARLESTON HARB.						
MORRIS ISLAND	.....	Two fixed br. lts., 300 yds. apart	4a	55 40	10	1837
SULLIVAN Two fixed br. lts.	32 46.9 79 51.3	E. end of Battery on Island	4a	45 50	10	1848 1857
FORT SUMTER	.....	One fixed bright light	5a	57	10	1855
Castle Pinckney	.....	One fixed red light	5a	60	10	1855
Battery Beacon	.....	Gas light on E. end of Battery	..	45	..	1857

Name and Character of Light.	Lat. N. Long. W. o	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
HUNTING ISLAND One rev. br. lt., $\frac{1}{2}$ min., & One fixed bright light	32° 24.5 80° 24.5	On N. Point; and on W. side of entrance to St. Helena Island	2b | 108 6a | 39	17 ..	17 ..	1859
Cambahee Bank Lt. Vessel	.....	Intended, 1861 .....	..	..	..	....
CALIBOGUE LT. VESSEL	.....	Fixed br. lt., in 4½ fms., in Sound	●	30	10	1855

GEORGIA.

MARTIN'S INDUSTRY Lt. VESSEL Two fixed bright lts.	32° 5.5 80° 35.2	15 miles E. of Tybee Light. Fog horn and bell	●	44	12	1839 1855
TYBEE ISLAND Two fixed bright lts.	32° 1.3 80° 50.5	N.E. end, S. side of entrance to Savannah River; beacon lt. on Pt. of Tybee Id., $\frac{1}{4}$ mile E. of main light	2a | 108 4a | 62	16 12	1793 1856	
SAVANNAH RIVER						
TYBEE KNOLL Lt. Ves.	.....	Fixed bright light, N. of Id. Bell and horn	●	40	10	1848 1857
Cockspur Island One fixed bright lt.	32° 1. 80° 52.8	On a Knoll, E. end	5a	25	9	1849 1856
Oyster Beds	.....	Fixed red lt., opp. Cockspur Id.	6a	35	9	1849 1856
Fig Island One fixed bright lt.	32° 5. 81° 3.6	On E. end, in Savannah River. Fog bell	6a	26	9	1848 1856
The Bay	.....	Gas light, in Savannah city .....	..	77	9	1858
SAPELO ISLAND One fixed and flash. lt., One fixed bright light	31° 21.5 81° 24.	Tower, striped red and wh.; flash every 40 secs. S. end of Id.; N. side of Doboy Sound. Fixed light in front of former	4d | 74 5a | 50	14 11	1820 1854 1858	
WOLF ISLAND Two fixed bright lights	31° 18.2 81° 20.3	Near N. end	6a	25 15	9	1822 1856
ST. SIMON ISLAND One fixed bright light	31° 3.8 81° 32.5	S. end, on N. side of St. Simon's Sound	3a	80	14	1811 1856
LITTLE CUMBER- LAND ISLAND One fixed bright lt.	30° 53.9 81° 32.4	S. side of entrance to St. Andrew Sound, and Santilla River ..	3a	70	14	1838 1856

FLORIDA.

AMELIA ISLAND 1. One rev. br. lt., $1\frac{1}{2}$ m., and 1 fixed bright lt. 2. Two fixed bright lts.	30° 39.4 81° 30.9	1. Rev. lt., with fixed lt. in front of it, on N. end, and S. side of entrance to St. Mary's River. 2. Two fixed lts. on N. side of Id., leading into Fernandina Harbour	3b | 104 6a | 60 35	17 12 9	1838 1856 1858	
ST. JOHN'S RIVER One fixed bright light	30° 21.7 81° 27.5	S. side of entrance	3a	75	14	1829 1859
Dame's Point Lt. Vessel	.....	Small lt. off Point, St. John's R.	a	..	5	1857

UNITED STATES.

LIGHTHOUSES.

FLORIDA. 131

Visible in Miles.	Year established.	Name and Character of Light.	Lat. N. Long. W. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
17	1859	ST. AUGUSTINE	29 50.8 81 19.2	N. end of Anastasia Id., S. entrance to St. Augustine. Flash every 1½ min.	4d	68	14	1823
..	....	One fixed and flash lt.						1854
10	1855	CAPE CANAVERAL	28 27. 80 33.	White tower, 55 feet high, on N.E. part .....	..	65	14	1847
12	1839 1855	One rev. br. lt., 1 min.						
16	1793 12 1856	JUPITER INLET	26 55.4 80 5.1	Tower, 10 feet high. Fixed lt., with flash every ½ min.	1d	146	18	1860
0	10 1848 1857	One fixed & flash. br. lt.						
25	9 1849 1856	CAPE FLORIDA	25 41. 80 3.	White tower, 96 feet high, on S. Point of Key Biscayne	2a	100	18	1825
35	9 1849 1856	One fixed bright light						1856
26	9 1848 1856	CARYSFORT	25 13.3 80 6.2	Dark tower, 112 feet high, on the Reef	1b	106	18	1852
77	9 1858	One rev. br. lt., ½ min.						1857
74	14 1820	DRY BANK	24 37.6 81 6.7	Red pile lt. ho., 149 ft. high, near Coffin Patches and Sombrero Key	1a	144	18	1857
50	11 1854 1858	One fixed bright light						
25	9 1822	SAND KEY	24 26.5 81 51.2	Flash every 2 min. Dark tower, 121 ft. high, 7½ miles S.W. of Key West Lt.	1d	110	18	1826
15	9 1856	One fixed and flash. lt.						1853
80	14 1811 1866	KEY WEST						
70	14 1838 1866	S.W. Point of Island	24 33. 81 49.3	White tower, 50 feet high	3a	50	13	1825
104	17 1838 6 1856	One fixed bright lt.						1853
60	12 1858	N. W. Passage	24 37.1 81 55.2	On iron screw Piles, in 6 feet ..	4a	40	12	1838
35	9 1856	One fixed bright lt.						1854
75	14 1829 1869	LOGGERHEAD KEY	24 37.3 82 55.2	Round tower, 150 feet high, on centre of W. Key	1a	152	20	1858
..	5 1857	One fixed bright lt.						
104	17 1838 6 1856	GARDEN, or BUSH KEY	27 37.3 82 53.7	On Jefferson Fort	4a	70	14	1825
60	12 1858	One fixed bright lt.						1858
25	9 1856	EGMONT	27 36. 82 45.7	Entrance of Tampa Bay, on the Key	4a	45	12	1848
80	14 1811 1866	One fixed bright lt.						1857
70	14 1838 1866	CEDAR KEYS	29 5.7 83 4.8	Flash every min. On E. Mound of Seahorse Key	4d	75	15	1854
104	17 1838 6 1856	One fixed and flash. lt.						
104	17 1838 6 1856	ST. MARK'S HARBOUR	30 4.4 84 10.6	E. side of entrance	4a	73	14	1829
60	12 1858	One fixed bright light						1856
35	9 1858	DOG ISLAND	29 46. 84 34.7	White tower, 44 ft. high, on E. side of Middle entrance to St. George's Sound	4b	48	13	1838
75	14 1829 1869	One rev. br. lt., 1 min.						1856
..	5 1857	CAPE ST. GEORGE	29 36.2 84 58.6	White tower, 70 feet high, on the Cape	3a	77	15	1847
35	9 1858	One fixed bright light						1857
104	17 1838 6 1856	CAPE ST. BLAS	29 41.7 85 24.6	White tower, 50 feet high, 2 miles from S. Point of Cape ..	3b	96	16	1847
60	12 1858	One rev. br. lt., 1½ m.						1858
35	9 1858	PENSACOLA	30 19. 87 17.4	White tower, 160 ft. high, on S. side of entrance to Bay, near Barancas	1b	210	21	1824
..	5 1857	One rev. br. lt., 1 min.						1858

Name and Character of Light.	Lat. N. Long. W. o ,	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established
ALABAMA.						
SAND ISLAND	30 11.3 88 2.	1. Brick tower, 150 ft. high, 3 m. S.S.W. of Mobile Pt. 2. Beacon lts.; red lt. on E. Point, br. lt. on S. Point of Sand Id. Light- house, with red vertical stripe	1a ..	162 20 | 19 9	1838 1858 1854	
MOBILE BAY						
MOBILE POINT	30 13.8 88 0.5	1. White tower, 53 feet high, on E. side of entrance to Bay. 2. Beacon lights	4a ..	58 20 | 13 9	1821 1858 1854	
CHOCTAW POINT	30 40.2 88 2.	White tower, 43 feet high, a little S. of Mobile city	4a ..	45 | 11	1831 1857	
Choctaw Pass	.....	Two small beacon lights .....	.. ..	15 | 3	1855	

MISSISSIPPI AND LOUISIANA.

MISSISSIPPI SD.

ROUND ISLAND	30 17.5 88 34.2	Off Pascagoula Bay	4a ..	51 | 12	1833 1856
E. PASCAGOULA R.	30 21. 88 33.1	At Pascagoula	5a ..	.. | 10	1854
SHIP ISLAND	30 12.9 88 57.	On W. end	4a ..	51 | 13	1853
BILOXI	30 23.7 88 53.2	W. entrance to Bay	4a ..	62 | 13	1848 1856
CAT ISLAND	30 13.9 89 8.7	W. Point	4a ..	39 | 12	1831 1857
PASS CHRISTIAN	30 18.9 89 14.	6½ miles N.W. of Cat Island Light	4a ..	42 | 12	1831 1857
MERRILL SHELL BK.	30 14.3 89 13.9	A pile lighthouse, between Cat Island and Grand Island	4a ..	45 | 11	1860
St. Joseph's Island	.....	Building, 1861 .....	.. .. ..	..	....
PROCTORSVILLE	29 52.2 89 39.4	Lake Borgne	6a ..	39 | 10	1850

LAKE PONTCHARTRAIN

PLEASANTON ISLAND	.....	E. entrance of Lake, near Pearl River	4a ..	60 | 13	1838
One fixed bright lt.					1857
RIGOLETS	30 9.4 89 38.1	E. entrance of Lake	5a ..	30 | 10	1855
One fixed bright lt.					
BON FOUCA	30 2.3 90 2.8	Near Mouth of Bay on Bon Fouca	5a ..	39 | 11	1843
One fixed bright lt.					1857
PORT PONTCHARTRAIN	.....	Near E. end of Railroad. Flash every 1½ min.	5d ..	35 | 10	1838
One fixed & flash. lt.					1855

Visible in Miles.	
Year established.	

UNITED STATES. Lighthouses. MISSISSIPPI, &c. 133

Name and Character of Light.	Lat. N. Long. W. ° ,'	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
LAKE PONTCHARTRAIN						
BAYOU ST. JOHN One fixed bright lt.	30 2. 90 4.	5 miles N. of New Orleans	6a	39	10	1811 1855
New Canal	.....	Fixed bright light, at entrance ..	5a	33	10	1838
Tchefuncta River	.....	Fixed br. lt., near Madisonville	5a	38	11	1837
PASS MANCHAC One fixed bright lt.	30 17.8 90 12.7	S. side, between Maurepas and Pontchartrain Lakes	4a	45	10	1838 1857
CHANDELEUR ID. One fixed bright light	30 3.4 88 51.8	White tower, 50 feet high, on N. end	4a	50	13	1848 1855
MOUTHS OF MISSISSIPPI						
PASS À L'OUTRE One fixed bright lt.	29 8.6 89 1.5	Blacktower, 69 ft. high, on Middle Ground Id., N. side of entrance	3a	77	15	1855 1868
GORDON ISLAND One rev. br. lt., 1½ m.	28 59.7 89 7.4	S. Point of Id. South Pass, S.W. side	3b	60	13	1831 1858
Deer Island One fixed bright lt.	.....	At junction of S.W. and N.E. Passes	6a	..	5	1852
SOUTH WEST PASS One fixed bright lt.	28 58.5 89 21.	White tower, 68 ft. high, on W. side of entrance of River	3a	70	15	1831 1855
TIMBALLIER BAY One fixed bright light	29 4. 90 16.5	W. side, Grand Pass	4a	60	13	1855
SHIP ISLAND SHOAL One fixed and flash. lt.	28 55.1 90 55.9	Brown pile lighthouse. Fixed lt., with flash every $\frac{1}{2}$ min.	2d	110	17	1860
S.W. REEF One fixed red light	29 25. 91 30.	On the Reef	4a	49	12	1858
SHELL Keys One fixed bright light	29 20. 91 49.	Pile lighthouse, 81 feet high, on S. extremity	3a	71	13	1859
SABINE PASS One fixed and flash. lt.	29 43.9 93 50.3	White tower, 75 feet high, on Brant Point, E. side of River. Flash every $\frac{1}{2}$ min.	3d	85	16	1856

TEXAS.

GALVESTON BAY						
BOLIVAR POINT One fixed bright lt.	29 22.6 94 45.7	Red tower, 89 feet high, N. side of entrance to Galveston Harb.	3a	100	16	1852 1858
Galveston	.....	2 fixed br. lts., in range of Chan.	6a	..	10	1860
Galveston Beacons	.....	2 fixed bright lts., in the city ..	6a	44	..	1856
Half-moon Shoal One fixed bright lt.	.....	Between Pelican Id. and Dollar Point. Fog bell	6a	35	10	1854
Red Fish Bar	.....	Fixed bright light. Fog bell ..	6a	35	10	1854
Clopper's Bar	.....	Fixed bright light. Fog bell ..	6a	35	10	1854

Name and Character of Light.	Lat. N. Long. W. o	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
MATAGORDA BAY						
MATAGORDA ID. One rev. br. lt., 1½ m.	28 21. 96 23.9	Tower, with bands, 79 feet high, on E. Point	3b	96	16	1852 1858
Siluria	.....	Fixed bright light, on N. side ..	6a	33	6	1858
Half-moon Reef	.....	Fixed br. lt., on E. end. Fog horn	6a	40	6	1858
Swash	.....	Fixed br. lt., opp. Alligator Hd.	5a	38	6	1858
ARANSAS PASS						
One fixed bright light	27 53.4 96 56.5	Brown tower, 55 feet high, on Low Island, on N. side	4a	60	13	1858
BRAZOS SANTIAGO						
PADRE ISLAND One fixed bright lt.	26 6. 97 12.	S. Point, N. side of entrance ..	5a	35	10	1852
ISABEL POINT One fixed & flash. lt.	26 4.9 97 11.1	Flash every min. White tower, 57 feet high, on the Point....	3d	82	16	1852 1857
Rio Grande	.....	Building, 1861 .....	...	...	...	....

WEST INDIES.

LIGHTHOUSES. THE BAHAMAS, &c. 135

Visible in Miles.	Year established.	Name and Character of Light.	Lat. N. Long. W. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
16 | 1852	1858	ABACO One rev. br. lt., 1 min.	25 51.5 77 10.7	(British). White and red tower, 85 ft high, on S.E. Point, or Erole in the Wall .....	..	160 | 16	1848	
6 | 1858		NASSAU HARBOUR One fixed bright light	25 5.6 77 22.	(British). Stone tower, 58 feet high, on W. Point of Hog Id.	..	68 | 10	1847	
6 | 1858		GREAT ISAAC One rev. br. lt., $\frac{1}{2}$ min.	26 2. 79 6.5	(British). Red and white tower, 145 feet high, on Island	●	158 | 16	1859	
6 | 1858		GUN KAY One rev. br. lt., $1\frac{1}{2}$ m.	25 34.6 79 18.8	(British). Tower, 70 feet high, near S. Point .....	..	80 | 12	1836	
13 | 1858		KAY SAL BANK One fixed bright light	23 56. 80 28.5	(British). White and red tower, 58 feet high, on N. Elbow Kay	..	96 | 14	1839	
5 | 10 | 1862		KAY LOBOS One fixed bright light	22 22.8 77 35.8	(British). Red and white iron tower, 150 feet high, on Kay	1a	146 | 16	1860	
2 | 16 | 1852	1857	TURKS ISLAND One fixed and flash. lt.	21 31. 71 7.7	(British). White tower, 60 feet high, 400 yards from N. end. Flash every $\frac{1}{2}$ min.....	..	108 | 15	1852	

CUBA (Spanish).

ST. IAGO DE CUBA	19 57.5 One rev. br. lt., 1 m.	E. side of Morro Castle	4b	223 | 20	1842
CRUZ CAPE	19 50.2 One fixed bright lt.	Building, 1861	2a	106 | 15	....
JAGUA, XAGUA, OR CI- BNFUGOS HARB.	22 1.2 80 40.3	Colorado Point, E. of entrance..	3b	81 | 14	1851
One rev. br. light					
Batabano	22 43.4 One fixed br. light	Lantern, on a Mast.....	..	31 | 3	1847
82 18.					
ISLE OF PINES	21 26. One rev. bright light	Proposed, 1861, on Cape Pepe ..	2b	111 | 16	....
83 6.					
SAN ANTONIO	21 51.8 One rev. br. lt., 1 m.	Roncali Tower, 117 feet high, on the Cape	2b	107 | 20	1850
85 1.3					
JUSTIAS	22 43.3 One fixed & flash. lt.	Proposed, 1861, on the Kay	2d	129 | 16	....
84 6.5					
GOBERNADORA	23 0. One rev. bright light	Proposed, 1861, on the Point ..	2b	111 | 15	....
83 13.2					
HAVANA	23 9.3 One fixed & flash. lt.	On Morro Castle, E. entrance. Flash every $\frac{1}{2}$ min.....	1d	144 | 21	1847
82 22.1					
Port Santa Cruz	.....	Fixed bright light .....	..	.. | 7	1858
GUANOS	23 9. One rev. br. lt., 1 m.	Proposed, 1861, on the Point ..	3b	92 | ..	....
81 42.					

Note.—The latitudes and longitudes on the Coast of Cuba are uncertain, probably to a considerable amount.

Name and Character of Light.	Lat. N. Long. W. o	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established
CARDENAS BAY	23 14.4	Flash. It., red flash every $\frac{1}{2}$ min., on Piedras Kay. Fixed red	4d	66	16	1857
One fixed & flash. lt.	81 7.5	and br. lt. on Anas Kay		48	9	1846
BAHIA DE CADIZ	23 13.	Proposed, 1861, iron tower, 169 feet high, on the Kay	1b	175	20	....
One rev. br. lt., 1 m.	80 30.					
Anguila	23 29.	Proposed, 1861, on S.E. Kay ...	4d	...	8	....
One fixed & flash. lt.	79 32.					
KAY PAREDONE	22 29.4	Iron tower, 128 feet high, on N. part. Flash every min.	1d	159	20	1859
GRANDE	78 9.7					
One fixed & flash. lt.						
NUEVITAS HARB.	21 39.6	Colon tower, 170 feet high, on Maternillos Point	1b	174	23	1849
One rev. br. lt., 1 m.	77 10.9					
LUCREZIA	21 10.	Building, 1861, on the Point ...	1b	112	15	....
One rev. bright lt.	75 38.					
CAPE MAYSI	20 16.	Building, 1861. [There is a temporary lt. at 53 ft., vis. 10 m.]	2a	124	15	....
One fixed bright lt.	74 7.					

JAMAICA (English).

MORANT POINT	17 56.	White tower, 96 feet high.....	..	115	15	1842
One rev. br. lt., 1 m.	76 11.2					
PLUM POINT	17 55.7	Red between W.N.W. $\frac{1}{4}$ N. & N. $\frac{1}{4}$ E. Br. from N. $\frac{1}{4}$ E. to S.E.	..	68	12	1854
One fixed red or br. lt.	76 47.					
Fort Augusta	17 57.	Red to E.; bright to S. & W. ...	..	40	..	....
One fixed red or br. lt.	76 53.					
SANTO DOMINGO	18 28.1	Tower, 100 feet high, on San Jose Fort .....	..	113	9	1853
One fixed bright light	69 52.5					
PUERTO RICO	18 29.	Fort San Juan, on the Morro ...	2b	171	20	1846
One rev. br. lt., 2 min.	66 7.1					
SANTA CRUZ, or ST. CROIX ISLAND	17 42.7	(Danish). ....	..	..	4	1857
One fixed bright lt.	64 52.7					
ST. THOMAS	18 19.4	(Danish). E. entrance, on Mohlenfels Point .....	..	95	12	1844
One fixed bright light	64 55.1					
SOMBRERO	18 35.8	(British). Proposed, 1861, on the Island .....	..	..	..	....
	63 27.7					
ST. CHRISTOPHER	17 18.	(British). On the Beach, at Basse Terre .....	..	37	12	1846
One fixed bright light	62 42.5					
Montserrat	16 43.	(British). 2 fixed br. lights for Mail Steamers, on the Beach at Plymouth .....	..	..	..	....
	62 12.					
Antigua	17 0.	(British). Fixed triangularly, upper lt. red, for Mail Steamers	..	62	8	1848
Two fixed br. lights, &	61 45.7					
One red light						

etc.

Visible in Miles.	Year established.
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WEST INDIES.

LIGHTHOUSES: CARIBEE IS., &c. 137

Name and Character of Light.	Lat. N. Long. W. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
GUADALOUPE (French).						
Moule de Port One fixed bright lt.	16 23.7 61 21.	[Position uncertain] .....	.. | .. | 7	1858		
Pointe à Pitre	.....	Lantern, S. of town .....	.. | .. | ..	....
Muron Islet	.....	Lantern .....	.. | .. | ..	....
Grozier Islet	16 14.1 61 24.7	One fixed bright light .....	.. | .. | ..	....
PETITE TERRE One fixed br. light	16 10.5 61 4.9	Tower, 75 feet high	3a | 108 | 15	1858		
Dominica	15 18. 61 25.	(British). Light on Fort Young flagstaff.....	.. | .. | ..	....
MARTINIQUE	14 36.1	(French). Red lt. on Pointe de Nègres, in Fort. Br. light in	.. | 62 | 11	1855		
One fixed red, & 1 br. lt.	61 4.6	Fort Royal, S.W. part	131 | 6	....	
ST. LUCIA	14 0. 61 5.	(British). 2 lts. on Tapion Bat- tery, S. entr. of Castries Harb.; 1 light on Wharf. For Mail Steamers .....	.. | 80 | 3	1843		
St. Vincent	13 13. 61 15.	(British). On Fort Charlotte, for Mail Steamers .....	.. | 610 | 6	1858		
One fixed bright light						
TRINIDAD	10 38.7 61 31.9	(British). In Port Espana, on the Jetty .....	.. | 50 | 5	1841		
One fixed bright light						
TOBAGO	11 10. 60 44.	(British). Scarborough, on Ba- colet, or Red Point.....	.. | 128 | 12	1842		
One fixed bright light						
BARBADOS (British).						
Carlisle Bay	13 4. 59 37.2	Bright to S. of E.; red to N. of E. .....	.. | 34 | 5	1855		
One fixed br. or red lt.						
S. POINT	13 2.7 59 33.5	Red and white striped tower, 90 feet high.....	.. | 145 | 18	1852		
One rev. br. lt., 1 m.						

GUAYANA.

Cayenne	4 56.2 52 14.8	(French). On Infantry Bar- racks .....	.. | 69 | 8	1850
One fixed bright light				
SURINAM LIGHT VESSEL	6 4. 55 9.5	(Dutch). In 4 fathoms, off Bram Point .....	.. | 30 | 7	1858
One fixed bright light				
BERBICE HARBOUR LT. VESSEL	6 19.3 57 22.5	(British). Near E. Point of en- trance .....	.. | .. | 15	1850
One fixed bright light				
DEMERARA (British).				
LIGHT VESSEL	6 55.5 58 1.5	In 4 fms., 10 miles N.N.E. of E. from River entrance .....	.. | .. | 12	1844
One fixed bright lt.				
E. SIDE	6 49.3 58 11.5	Red and white tower, 100 ft. high, on E. side of River entrance..	.. | 103 | 14	1829
One fixed bright lt.				

Name and Character of Light.	Lat. N. Long. W. o /	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles	Year established
TIERRA FIRME Orinoco River Lt. Vessel	8 37. 60 42.	Sunk in 1859. Not likely to be replaced .....	...	...	...	....
Puerto Cabello	10 29. 63 o	(Venezuelan). Proposed, 1861 .....	...	...	...	....
Tucacas One fixed bright light	10 47. 68 24.	(Venezuelan). Brava Point ..	..	30 | 0	....
BUEN AYRE One fixed bright light	12 2.5 68 22.5	(Dutch). Lacre Point, S. Point	●	85 | 12	....
LITTLE CURACAO ISLAND One fixed bright light	11 58. 68 44	(Dutch). On S. side.....	●	62 | 10	1850	
Great Curacao Island One fixed bright light	12 6. 68 59.	(Dutch). St. Ann Harbour, on Rif Fort .....	..	.. | ..	1850	
Rio de la Hacha One fixed bright light	11 33. 72 59.	(New Granada). On the Church	..	69 | 6	1857	
LIMON, OR NAVY BAY, One fixed bright light	9 23.8 79 53.	(New Granada). N.W. part of Manzanillo Island .....	..	60 | 10	1852	
HALF-MOON KAY One fixed bright light	17 12.3 87 32.4	(British). On S.E. Point.....	..	88 | 18	1848	
Belize Three fixed bright lts.	17 19.6 88 4.	(British). S. side, on English Kay .....	..	95 | 3	1846	
TURNER KAYS Three fixed bright lts.	17 36. 87 46.	(British). Fixed triangularly, on Mauger Kay, N.W. Point....	..	95 | 13	1846	
GULF OF MEXICO						
SISAL One fixed bright light	21 10. 90 3.	(Mexican). On the Castle .....	..	60 | 10	1852	
Terminos de Laguna One fixed bright light	18 38.5 91 54.	(Mexican). In Indian village..	..	75 | ..	1856	
Coatzacoalcos River One fixed bright light	18 12. 94 17.	(Mexican). [Temporary light is shown while lighthouse is building, 1861.] .....	..	.. | ..	....
VERA CRUZ One rev. bright light	19 12.3 96 7.2	(Mexican). Fort San Juan de Ulloa .....	..	80 | 15	....
Tampico	22 15. 97 46.	(Mexican). Small light on N. Point, for Mail Steamers .....	..	.. | ..	....

SOUTH AMERICA,

LIGHTHOUSES.

East Coast. 139

Name and Character of Light.	Lat. S. Long. W. •	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established
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BRAZIL.

PARA	0 34. One rev. bright light 47 17.1	On Atalaia Point 17 1852
ITACOLOMI	2 10. One rev. red & br. lt., 2 min.	Tower, 75 ft. high, on the Point. Rod and bright alternately 147 15
MARANHAN	2 29.5 One fixed bright light 44 16.	San Luis, on San Marcos Fort..	... | ... | 10 | 1829
SANT' ANNA	2 19. One rev. br. lt., 40 secs. 43 31.	E. part of Island (may be discontinued) .....	... | ... | ... | ....
Ciara	3 41. One fixed bright light 38 29.	Macoripe Point .....	... | 37 | 10 | 1847
RIO GRANDE DO NORTE	3 45. One fixed bright light 35 13.15	On Fortress, off Santos Reis Magos .....	... | 43 | 12 | 1860
PERNAMBUKO	8 3.7 One rev. br. & red lt., 1 min.	On the Roof, 50 yards from Pacaõ Fort. Twice bright, and once red.....	... | ... | 22 | 1824
MACEIO	9 39.3 One fixed and flash. lt. 35 41.4	W. part of Mountain. Flash every 2 min.....	... | 208 | 22 | 1856
BAHIA, or SAN SAL- VADOR	13 0.9 One rev. br. & red lt., 1½ min.	On Fort San Antonio. Twice bright, and once red .....	... | 140 | 18 | 1823
MORRO DE S. PAOLO	13 21.7 One rev. br. lt., 1 min. 38 54.8	On the Morro .....	... | 276 | 20 | 1854
CAPE FRIO	23 1.3 One rev. br. lt., 2 min. 41 58.2	On the summit .....	... | 1000 - 20 | ....
RAZA	23 5.7 One rev. br. & red lt., 2½ min.	Red tower, 50 feet high, on the Island .....	... | 315 | 14 | 1828
RIO DE JANEIRO	22 56.6 One fixed br., & 1 red light 43 7.3	Br. lt. on Fort Santa Cruz, E. entrance. Red lt. on Calhabouco Point .....	... | ... | 6 | 1839 ... | ... | 1856
SANTOS	24 2. One fixed bright light 46 3.	White tower, 40 feet high, on Moela Island .....	... | 100 | 12 | 1831
RIO GRANDE	32 7.3 One rev. br. lt., 2 min. 52 4.4	1 1-10 mile from N. Point of entrance .....	... | 96 | 14 | 1851

BUENOS AYRES.

RIO DE PLATA						
MALDONADO BAY	34 58. One fixed bright lt. 54 56.	(Banda Oriental). Tower, 90 ft. high, on E. Point.....	a | 152 | 10 | 1860			
FLORES	34 57. One rev. br. lt., 3 m. 55 55.8	(Banda Oriental). White tower, 65 feet high, on Island (light not to be depended on) .....	... | 104 | 12 | 1833		

Name and Character of Light.	Lat. N. Long. W. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
RIO DE PLATA						
ENGLISH BANK LT. Vessel	35° 6. 55° 54.	(Banda Oriental). In 7 fms., on N. part .....	...	10	1857	
One fixed bright lt.						
MONTE VIDEO	34° 53.3 56° 14.7	(Banda Oriental). On Mt., W. side of Harb., flash every 3 m.	486	25	1852	
One fixed & flash. lt.						
ORTIZ BANK LT. Vessel	35° 11.5 57° 1.3	(Buenos Ayrean). In 3½ fms., 8 m. N.E. ¼ N. from Indio Pt.	●	30	10	1857
One fixed bright lt.						
CHICO BANK LT. Vessel	34° 47. 57° 29.2	(Banda Oriental). In 5 fms., 13 m. N.E. ¼ N. from Atalaia Pt.	...	20	9	1857
One fixed bright lt.						
COLONIA	34° 28.2 57° 49.7	(Banda Oriental). On S.W. Angle of Plaza.....	...	110	10	1855
One rev. br. lt., 3 m.						
Buenos Ayres Gd. Ship	34° 34.5 58° 16.	(Buenos Ayrean). In 2½ fms., in outer Roads .....	...	20	7	1857
One fixed bright lt.						

PATAGONIA.

FALKLAND ISLANDS	51° 40.7 57° 41.8	(British). White and red striped tower, 60 ft. high, on C. Pembroke	●	110	14	1855
One fixed bright light						

CHILE.

CHILOE ISLAND	41° 46.7 73° 55.7	N. part, San Carlos de Ancud ..	4d	197	12	1859
One fixed & flash. br. lt.						
Concepcion Bay	36° 36. 73° 6.	Proposed (1861) on Quiriquina Island .....	...	...	...	....
VALPARAISO	33° 1.2 71° 41.5	White tower, 61 feet high, on Angeles, or Playa Ancha Pt. Flash every min.	4d	197	20	1857
One fixed & flash. br. lt.						
Huasca	28° 28. 71° 19.	Proposed (1861) .....	...	...	...	....
Caldera	27° 3. 70° 56.	Proposed (1861) .....	...	...	...	....

Peru.

CALLAO	12° 4. 77° 19.5	On N. Point of Lorenzo Id. ....	...	980	12	1857
One fixed bright light						

Ecuador.

GUAYAQUIL	3° 10. 80° 26.	(Peruvian): Middle of Santa Clara Island .....	...	...	...	1847
One fixed bright light						

Costa Rica.

NICOYA GULF	5° 59.6 84° 49.3	Punta Arenas	38	65	10	1856
One fixed bright lt.						

Mexico.

Acapulco	16° 50.3 99° 52.	On Grifo Pt., for Mail Steamers	...	...	...	1858

asts.

Visible in Miles.	
Year established.	

NORTH AMERICA,

LIGHTHOUSES.

West Coast. 141

Name and Character of Light.	Lat. N. Long. W. ° °	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
CALIFORNIA.						
SAN DIEGO One fixed bright light	32 40.2 117 12.4	Near Point Loma, W. side of entrance	3a | 457 | 25 | 1855			
San Pedro	33 46. 118 18.	Building (1861) on Fermin Point .....	... | ... | ... | ....		
Huenme	.....	Building (1861) on the Point ..	... | ... | ... | ....		
SANTA BARBARA One fixed bright light	34 23.6 119 42.1	On Bluff, 2 miles S.W. of landing-place	4a | 180 | 12 | 1856			
CONCEPTION One rev. br. lt., $\frac{1}{2}$ min.	34 26.8 120 25.5	On the Point. Fog bell	1b | 250 | 23 | 1855			
MONTEREY One fixed bright light	36 38. 121 55.	Grey tower, 35 feet high, on S. side of Point Pinos	3a | 91 | 13 | 1854			
Santa Cruz Harbour	.....	Building (1861) .....	... | ... | ... | ....		
FARALLON One rev. br. lt., 1 min.	37 41.9 122 59.1	On summit of S.E. Islet	1b | 360 | 26 | 1855			
SAN FRANCISCO						
BONITA One fixed bright lt.	37 49.2 122 30.8	On N. Point of entrance of Golden Gate. Fog bell	2a | 306 | 24 | 1855			
LOBOS POINT One fixed & flash. lt.	.....	On S. Point of entrance	2d | ... | ... | 1861			
FORT, S. POINT One fixed bright lt.	37 48.4 122 27.6	White tower, 36 feet high. Fog bell and horn	5a | 52 | 12 | 1855			
ALCATRAZ ISLAND One fixed bright lt.	37 49.6 122 24.4	White tower, 36 feet high. Fog bell	3a | 166 | 14 | 1854			
REYES One fixed & flash. br. lt.	37 59.6 123 0.3	Building on the Point (1861). Flash every $\frac{1}{2}$ min .....	... | ... | ... | ....		
Cape Mendocino	40 29. 124 32.	Building (1861) on the Cape ..	... | ... | ... | ....		
HUMBOLDT HARBOUR One fixed bright light	40 46.1 124 12.3	White tower, 45 feet high, on N. side of entrance	4a | 53 | 12 | 1856			
CRESCENT CITY One fixed & flash. br. lt.	41 44.6 124 11.4	On outer end of Island, which forms S. and W. sides of Harb. Flash every $1\frac{1}{2}$ min.	4d | 80 | 14 | 1856			
UMPQUA RIVER One fixed bright light	43 40.3 124 11.1	White tower, 83 feet high, on the Sands	3a | 100 | 16 | 1857			
CAPE HANCOCK One fixed bright light	46 16.6 124 2.	On slope of Cape ; Columbia River. Fog bell	1a | 230 | 22 | 1856			
CAPE FLATTERY One fixed bright light	48 23.3 124 43.8	Juan de Fuca Strait; on Tatoosh Id., $\frac{1}{2}$ mile N.W. of Cape ..	1a | 162 | 20 | 1857			
NEW DUNGENESS One fixed bright light	48 11.7 123 7.5	Juan de Fuca Strait; on N. end e" Sand Spit. Fog bell & horn	3a | 100 | 14 | 1857			

Name and Character of Light.	Lat. N. Long. W. o ,	Description, &c.	Description of Apparatus	Height above H. W.	Visible in Miles.	Year established.
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BLUNT, or SMITH ID.	48 19.2	Juan de Fuca Strait; on highest part of Id.	4b	90	15	1868
One rev. br. lt., $\frac{1}{2}$ min.	122 50.8					
Admiralty Head	48 10.	Whidbey Id., at entrance of	..	119	17	1861
One fixed bright light	123 20.	Admiralty Inlet.....				

BRITISH COLUMBIA.**VANCOUVER ID.**

RACE ISLANDS	48 17.5	On the Rocks.....	2a	..	..	1861
One flash. br. lt., 10 s.	123 32.2					
ESQUIMALT	48 25.6	Fisgard Id., S. Point. Red, 140°; green, 20°.	4a	65	..	1860
One fixed red, br., or green light	123 27.2					
SITKA	57 2.9	(Russian). New Archangel. ....	..	..	..	....
One fixed bright light	135 17.3	Lighted when a vessel at sea fires a gun				

PACIFIC OCEAN.**SOCIETY ISLANDS.**

Tahiti	17 30.	On Point Venus .....	..	..	6	1866
One fixed bright lt.	149 29.					

HAWAII, or SANDWICH IDS.

KARAKAKOA BAY	19 28.	Building (1861) on the Point of Hawaii (Owhyhee) Island, on which Capt. Cook was killed	..	..	..	....
One fixed bright lt.	155 55.					
CAPE KAWAIHOA	21 45.	Building (1861) on Oneeheow Id.
	160 12.					

5 | 1858

7 | 1861

.. | 1861

.. | 1860

.. | ...

6 | 1856

.. | ...

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